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Addison's Disease Complicating Spinal Caries.—This case is reported because Addison's disease complicating spinal caries is a rare condition; the course of the disease was very acute; the resemblance at one time to a case of intestinal obstruction was confusing; and survival of the patient for so many years after what must have been severe pulmonary trouble. A man, aged 40 years, was admitted to hospital June 10, 1932, with a history that he had "suffered from lumbago and sciatica for two years, which have been relieved by bed rest." He was in a sanatorium twenty years ago with phthisis. At the time of admission he had a cold abscess in the left loin, from which was aspirated pus which contained tubercle bacilli. A radiogram of the spine showed caries of the 12th thoracic vertebra with some involvement of the 11th and 1st lumbar. Physical examination, October 22, 1932, showed a granulating wound in the left loin, but this appeared healthy. The patient looked ill and had slight deep-brown pigmentation, which was general over the body but was most marked on the exposed skin surfaces and the buccal mucous membrane. Shortly before death the patient had several days of incessant vomiting and intractable hiccough. The pigmentation rapidly became more intense. The maximum systolic pressure was 96. The patient died November 9. At necropsy the adrenals were found to be completely disintegrated into typical tuberculous caseous material. The lungs were broken up by dense fibrous tissue. The terminal event was a puruloplastic pericarditis.—*Addison's Disease Complicating Spinal Caries, H. J. Knight, Brit. M. J., April 29, 1933, no. 3773, 744.*—(*T. O. R.*)

Addison's Disease in Cancer of Lungs.—Two cases of pulmonary carcinoma in which the clinical symptoms of Addison's disease occurred are reported. It is of interest that Addison himself drew attention to the occurrence of cancer of the suprarenals associated with cancer of the lungs, although he expressed no opinion as to the primary site of the process. A woman of 48 entered the hospital, complaining of cough, loss of weight, and weakness. Symptoms of arthritis had been present for a year. A diagnosis of carcinoma of the right lung was made and deep X-ray therapy was given. Two months after admission pigmentation over the face was noticed. Low blood-pressure and asthenia were present. Three months later the patient died. Autopsy revealed an extensive adenocarcinoma of the right upper-lobe bronchus with metastases in the suprarenals, pancreas, spleen, mesenteric and preaortic lymph nodes, and in the left frontal lobe of the brain. The second patient, a woman of 49, had refused for six months to enter the hospital despite per-

sistent cough, loss of weight, weakness, and anorexia. Pain in the left hip developed, and became so severe that she sought admission. The marked asthenia and a blood-pressure consistently below 100 led to a diagnosis of suprarenal involvement despite the absence of pigmentation. The physical signs and X-ray findings indicated carcinoma of the right upper lobe. There was evidence of obstruction of the superior vena cava. Death occurred in a month. Autopsy revealed a squamous-cell carcinoma of the right lobe with infiltration of the right parabronchial and the infratracheal lymph nodes, and metastases to the upper end of the shaft of the femur with pathological fracture, and to the left suprarenal which was replaced by a tumor 9 by 4 by 4 cm. in size.—*Clinical Symptoms of Addison's Disease Occurring in the Course of Pulmonary Carcinoma, F. J. Poynton, G. P. Wright, and L. P. E. Laurent, Lancet, April 8, 1933, ccxxiv, 740.*—(*R. D.*)

Adrenals in Tuberculosis.—The adrenals, in 61 cases of tuberculosis, had an average weight of 6.3 gm., while 13 per cent showed amyloid as part of a general amyloidosis. A diminution in lipoids was found in 88.6 per cent (pronounced in 65.5 per cent), and in 11.4 per cent there was an abnormal increase in fats, also involving the *zona globosa*. Tuberculous foci were present in only 5 per cent, and congestion in 44 per cent, with increased connective-tissue formation. In 23 per cent brown pigment was found in the reticular cells, most commonly after 30 years of age, being present only twice, and sparsely so, in 20-year-old individuals. Marked pigmentation occurred three times in individuals 39, 50 and 52 years of age. The male sex predominated in pigment findings. Small lymphocytes and plasma-cell infiltrations were noted in the majority of cases (75.4 per cent). Pycnosis and karyolysis occurred in 68 per cent. In 23 per cent there were cortical adenomata, increasing with advancing age. There was a relation between the fat-content and pigmentation, in that pigment deposits were greater in the fat-poor organism.—*Beitrag zur Morphologie der Nebennieren bei Tuberkulose, E. Hausmann, Virchow's Arch. Patholog. Anat., 1932, cclxxxv, 550.*—(*H. J. C.*)

Tuberculosis of Testicle.—Intratubular forms of testicular tuberculosis, according to summary statements in the literature, are recognized generally and have been studied with care. Testes with this form of tuberculosis doubtless progress into the chronic stages with caseation and fistulae or extensive scar-tissue contraction, and become so altered by the destructive disease that the initial characteristics are lost. The author reports a case of diffuse intratubular testicular tuberculosis in which the gross changes in the testis did not characterize the disease, although obviously the entire body was involved uniformly and equally. Histological examination after excision of the testicle demonstrated a diffuse intratubular exudate and a uniform disintegration of practically all the lining epithelium or a retention only of small remnants. Other characteristic histological changes demonstrated the nature of the condition, although the gross appearance of the cut testis was not characteristic. Acid-fast bacilli were demonstrated among the exudate cells. Inflammatory changes extended into surrounding interstitial tissues. Caseation was not conspicuous. The infection probably was diffused throughout the testicular tubules by an obstructive retrograde spread of tuberculous exudates from the vas and the epididymis. No clinical information was available on which to localize the initial genital tuberculosis beyond the vas. Attempts to demonstrate tuberculosis of the urinary tract subsequent to the right orchidectomy were not successful. Writers have noted the marked exudative reaction and subsequent tissue changes in the testes of tuberculous guinea pigs following the testicular injection of small quantities of tuberculin. Presumably, human tissues manifest a similar allergic response, and the marked cellular reactions in the testis of this patient, accordingly, are the summation of an intratubular tuberculous infection in a sensitized host.—*Diffuse Intratubular Tuberculosis of the Human Testicle, E. F. Hirsch, J. Am. M. Ass., April 15, 1933, c, 1160.*—(*G. L. L.*)

Experimental Tuberculous Meningitis.—A study of tuberculous meningitis in animals can show whether it can be caused by the presence of virulent organisms in the cerebrospinal fluid spaces, or whether in addition a definite allergic condition is also essential. In addition, it can aid in determining whether the spread of the infection is by way of the fluid. Also, it makes available therapeutic animal tests. The author's studies on nonsensitized rabbits revealed that a predominant basal meningitis could be produced in these animals by suboccipital infection, which, in spread and histological character, completely resembles clinically observed tuberculous meningitis. Conglomerate tubercles were not observed. This verifies Cohn's observations, while brain and brain-membrane tubercles, described by Burn and Finley, were not observed.—*Beitrag zur Frage der experimentellen Meningitis tuber-*

culosa, O. Fischer, Ztschr. f. Tuberk., 1933, lxviii, 158.—(H. J. C.)

Histology of Cold Abscesses.—Most authors assume that cold abscesses are formed through the leakage of pus from an original lesion of bone, a view that present studies did not confirm. The abscesses develop through a proliferation of tuberculous granulation tissue. Only after such granulation tissue is formed to a sufficient extent does caseation occur in its centre. It is assumed that the increased pressure in the osseous lesion presses the virus into the surrounding areolar tissue. The virus in cold abscesses is probably not of the classical acid-fast form.—*Über die Histologie der Senkungsabscesse, A. N. Tschistowitsch and I. S. Winogradow, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 765.—(M. P.)*

Sanatorium Treatment.—Tuberculosis patients, whose disease is of recent origin, derive their major benefits from sanatorium care. Cases with old and chronic disease do show some improvement, but it is much less marked and requires a longer cure. Long-standing disease of the exudative type, with localization in other organs, rarely improves in the sanatorium.—*L'importanza del sanatorio nella cura della tbc. polm., E. Tarantola, Tubercolosi, November, 1932, xxiv, 370.—(U. E. Z.)*

Sanatoria in Practice.—Statistics point out the important rôle played by the practising physician in the early discovery and treatment of pulmonary tuberculosis. They stress the easy accessibility of dispensaries, where diagnosis can be clarified from both positive and negative standpoints, and the freeing of sanatoria from all except tuberculosis cases. The active case of pulmonary tuberculosis should be sent to the sanatorium with all despatch. The early infiltrative forms, most readily benefited, should be given precedence, and thus required sanatorium stays be shortened. That this is not always the case is revealed in the present studies. The figures on 316 cases revealed a considerable loss of time before admission to a sanatorium. Early discovery and suitable treatment of pulmonary tuberculosis is emphasized as beneficial to the individual as well as the community.—*Wie steht es in der Praxis mit der "frühzeitigen" Erkennung und Heilstättenbehandlung der Lungentuberkulose? L. Lagreze and A. Orlowitsch-Wolk, Ztschr. f. Tuberk., 1932, lxvi, 7.—(H. J. C.)*

Postsanatorium Care of Tuberculosis.—The patient receiving pneumothorax therapy who can afford to stay in a sanatorium during the entire course of treatment presents few difficulties especially concerning after care following the subsidence of symptoms. The patients receiving institutional care under municipal or state control very often leave the sanatorium too early and, because of necessity or false confidence in their physical condition, return to work too soon with resulting breakdowns. In this way the benefits received are lost. The establishment of industrial colonies where these patients might go after leaving the sanatorium would allow graded work under medical supervision and more lasting results from the treatment obtained.—*Il trattamento post sanatoriale e la sorte dei pneumotoracizzatti, A. Muggia, Lotta contro la tubercolosi, December, 1932, iii, no. 12, 1286.—(U. E. Z.)*

Influence of Altitude and Light on Tuberculosis in Guinea Pigs.—In order to find out whether different altitudes influence the course of tuberculosis in guinea pigs, parallel experiments were performed in Berlin, in Geneva (altitude 375 m.), in Davos (altitude 1,570 m.) and on the Gornergrat (altitude 3,100 m.). Similar groups of guinea pigs were kept in these four locations in the dark, and in diffuse daylight, and one group was treated with eosin as a light sensitizer. Of the animals kept in the light, fewer died during the observation period. The animals treated with eosin and kept at high altitude had a higher mortality rate than any other group. Otherwise neither light nor altitude, nor eosin treatment caused significant differences in the distribution and histological structure of the tuberculous lesions.—*Untersuchungen über den Einfluss der Höhenlage auf mit Eosin lichtsensibilisierte tuberkulöse Meerschweinchen und den Veraluf der Meerschweinchentuberkulose überhaupt, nach einem einheitlichen Plan durchgeführt in Berlin, Genf, Davos und auf dem Gornergrat, Lange, Bamatter, Grüninger and Löwenstädt, Beitr. z. Klin. d. Tuberk., January, 1933, lxxxii, 1.—(M. P.)*

Treatment in Pulmonary Tuberculosis.—Pulmonary tuberculosis has many manifestations, and no hard-and-fast rules of treatment can be drawn for any one of them. In the nonclinical stage the patient should be kept under medical supervision. A course of sanatorium routine or a trip to Switzerland may be beneficial. The early progressive stage may be subdivided into three phases. In this stage the patient has the upper hand and is curable if the disease is properly handled. In the acute and subacute phases of this stage absolute rest in bed is indicated. It may be necessary to institute artificial

pneumothorax. If the fever persists and the physical signs increase, small doses of sanocrysin, tuberculin, or other substances to produce shock may be tried. Rest in bed should be continued for at least three months and longer if the temperature is unstable. When the patient begins to get up, sanatorium treatment is essential. Patients in the chronic phase may not have been through the acute or subacute phases. Rest in a good sanatorium is indicated. Switzerland is considered the Mecca by many. The objections to Switzerland in this phase of the disease are: *1:* The patient is apt to think that the fact of his being there is in itself treatment and consequently lives less carefully than he would at home. *2:* Discipline in most Swiss sanatoria is bad. *3:* Patients acquire the habit of spending the winter in the Alps. *4:* Posttuberculosis neurasthenia is more common. *5:* Recovery is no quicker than in England. The advantages are: *1:* The dry cold air and bright skies have an exhilarating effect on the patient. *2:* It is much easier to persuade a patient to carry treatment to the stage of cure. *3:* The psychological effect on those who believe that there is a charm for the cure of tuberculosis in the Swiss air. Improvement in this phase indicates the need for increased exercise, whereas failure to improve or a relapse necessitates further treatment. Sanatorium routine should be continued until the disease is arrested. The patient should be kept under observation for at least two years. In the late progressive stage the disease has the upper hand and the patient is on the defensive. In most cases treatment is mainly symptomatic. Controlled rest and exercise or even work may be the best solution. In the chronic fibroid stage the patient often has years of nearly, if not completely, good health. Treatment becomes necessary if the fibrosis is steadily increasing, haemoptyses are repeated, or attacks of pyrexia recur. Phrenic evulsion, thoracoplasty, or shock therapy may be necessary in either of these last two stages. The essential point is the urgent necessity for aggressive treatment in the early progressive stage.—*Principles of Treatment in Pulmonary Tuberculosis, L. S. T. Burrell, Brit. M. J., April 29, 1933, no. 3773, 731.*—(*T. O. R.*)

Treatment of "Early Infiltrate."—The author's observations on the "early infiltrate" over the years 1926 to 1931 indicate that patients with this condition should be given suitable sanatorium treatment as soon as possible. Thus, in the majority there will occur spontaneous and permanent retrogression. Beginning cavitation and even established cavities make immediate collapse treatment essential during sanatorium treatment. Exact clinical study, in which sputum findings stand foremost, will determine whether conservative or active treatment is indicated. Treated according to these lines, the prognosis of the "early infiltrate" is favorable and leads to healing in about 90 per cent of the cases.—*Das tuberkulöse Frühinfiltrat, insbesondere die Frage seiner Behandlung. (Nach dem Material der Jahre 1926–1931), H. Alexander, Ztschr. f. Tuberk., 1933, lxviii, 12.*—(*H. J. C.*)

Heliotherapy in Europe.—The author visited various European heliotherapy stations and compares the methods of application with those in use in this country. In general, while treatment is not given to patients with pulmonary tuberculosis, the treatment of surgical cases of tuberculosis is quite successful, especially in Switzerland at high altitudes. The carbon-arc is in general preferred to the mercury-arc, which is considered "too cold." High-altitude solaria in Switzerland depend principally on natural sunlight. In Denmark, where there is less sunlight, groups of carbon-arc installations are operated. Sun-porches usually face south or southeast, and exposures are begun soon after sunrise, no treatment being given at noon or afternoon hours. There is apparently no systematic equipment for measuring dosage intensity in the various solaria, the general dosage being empirical, depending on the physician's general experience and the patient's reaction. The attendant pays particular attention to even slight variations in the symptoms and condition of the patient. It is evident that an inanimate dosage meter, while desirable, especially in cases of inexperience or negligence on the part of the attendant, should not displace the personal attention that can be given by an experienced attendant.—*Report to the Council on Physical Therapy on Heliotherapy Methods in Some European Sanatoriums, W. W. Coblentz, J. Am. M. Ass., February 11, 1933, c, 410.*—(*G. L. L.*)

Vitamine Treatment in Tuberculosis.—In studying the effect of vitamine D upon the calcium equilibrium of the human body infected with tubercle bacilli, normal chemical relationships are prerequisite. Normal blood-calcium and phosphorus values are interwoven in the physicochemical complex of a normal acid-base balance. As one of the factors representing this balance, the hydrogen-ion concentration of the blood of 50 normal persons is compared with that of 75 persons in various stages of pulmonary tuberculosis. Both groups were on the same

dietary. All blood analyses were done during the months of May, June and July by the same chemist. All blood samples were drawn between two and five o'clock in the afternoon and were examined immediately. The average pH in the normal group was 7.37, and in the tuberculous group 7.38. The range of pH in the normal group was from 7.35 to 7.40, and in the tuberculous group from 7.33 to 7.45. The stage of the disease of the 75 tuberculous persons was classified as stage I in 7, as stage II in 22, and as stage III in 46. The average pH for the group in stage I, which was afebrile, was 7.38. The average pH for the group in stage II was also 7.38, but each patient that had a temperature of 99.4° or above had a pH of 7.40 or more. The average pH for the group in stage III was 7.39, and all patients except one with a temperature of 100° had a pH ranging from 7.40 to 7.45. It is concluded that if other metabolic processes are normal, pulmonary tuberculosis affects very little, if any, the hydrogen-ion concentration of the blood unless fever exists.—*Vitamin Therapy in Pulmonary Tuberculosis: IV. Comparison of the H-ion Concentration of the Blood in Tuberculosis with Normals on the Same Dietary, P. D. Crimm and H. L. Watson, Ann. Int. Med., July, 1933, vii, 109.*—(*R. M. F.*)

Splenic Extracts in Pulmonary Tuberculosis.—Five patients with pulmonary tuberculosis in varying stages of activity received hypodermic injections daily for thirty days. The injections were made into the subcutaneous tissues of the abdomen. An autolysate of spleen in ampoule form was used. Rapid red-blood-cell regeneration was noted in one case. There was concomitant improvement in the general condition of the patient. In 4 patients the haemoglobin percentage was increased and the red-cell count augmented. In this group the effects were only temporary. The clinical course of the disease in the latter cases remained unchanged. With increasing severity of the disease the Arneth blood-picture showed shifting to the left. Leucocytosis was not observed, and in very active and severe disease there occurred a partial or total disappearance of the eosinophiles. Splenotherapy is of value in tuberculosis, but must be started at the earliest possible moment during the evolution of the disease.—*Gli estratti splenici nella tubercolosi polmonare con riguardo al quadro neutrofilo D'Arneth, M. Mastroeni, Lotta contro la tubercolosi, December, 1932, iii, no. 12, 1290.*—(*U. E. Z.*)

Gold in Tuberculosis.—Notable improvement was noted in a large number of cases treated with gold salts. Some cases, favorably responsive to the treatment when given, suffered relapses. Resumption of the gold treatment in these cases was not followed by improvement. Gold preparations do not have a specific bactericidal action, but rather exhibit the stimulating action of metallic salts on diseased foci by arousing the defensive powers of the body. Gold therapy is still an open question and the last word has not been spoken. It is, however, a valuable therapeutic agent and adds much to the measures already at hand for combating the disease.—*La crisoterapia nelle malattie tubercolari, U. Carpi, Tubercolosi, November, 1932, xxiv, 365.*—(*U. E. Z.*)

Blood Changes during Gold Treatment.—It is widely recognized that anaemias of both the secondary, and more rarely the primary type, may develop during treatment by good salts. This study is concerned entirely with two other characteristic changes in the cytology of the blood, less generally recognized, namely, eosinophilia and leucocytosis. Of 57 patients treated by gold salts, an eosinophilia of more than 5 per cent occurred in 18. In all cases the eosinophilia was associated with some incident or complication of the treatment. In 15 cases this was a cutaneous or mucous-membrane lesion, such as an erythrodermia, urticaria, pruritus, stomatitis, etc. The onset of the eosinophilia at times preceded the appearance of the integumental lesions, but there was no instance of a dermatitis or stomatitis without an eosinophilia. In 3 cases the eosinophilia was associated with symptoms of a generalized idiosyncrasy to gold salts without localized skin or mucous-membrane lesions. Although the degree of the eosinophilia was variable and not always in agreement with the intensity of the observed complication, in general the percentage was higher in cutaneous than in mucous-membrane lesions, and in more intense than fleeting phenomena. The eosinophilia diminished with cessation of the treatment, and, although it usually reappeared on resumption, desensitization was sometimes possible. This eosinophilia is interpreted as both a toxic reaction and a hypersensitiveness to gold. It is apparently independent of the stage or state of the tuberculosis, and exerts no deleterious effect upon the course of the disease. The second striking modification of the haematocytology was a leucocytosis, which appeared in some tuberculous patients after they had received significant amounts of gold salts. The count often rose to 18,000 or higher, with a rise in the proportion of polymorphonuclear cells. Since it is generally conceded that gold salts

reactivate tuberculous foci, and since progressive tuberculosis is often associated with a leucocytosis, the conclusion is reached that the leucocytosis appearing during chrysotherapy results from such reactivation. Its appearance should therefore be considered significant warning to discontinue the treatment. Three cases are described in which injections of gold salts were continued despite the early leucocytosis and frank clinical signs and symptoms of reactivation, such as haemoptysis, hyperthermia, increased fatigue, cough and sputum, appeared.—*Étude des modifications sanguines au cours de la chimiothérapie par les composés auriques, P. Pavie, H. Mollard and P. Lefèvre, Rev. d. l. Tuberc., October, 1932, xiii, 804.*—(*A. E. M.*)

Treatment of Pulmonary Tuberculosis with Solganal.—Sixty patients with pulmonary tuberculosis were treated with *Solganal*, and a few other cases with various other gold preparations. Of 60 *Solganal* patients marked improvement occurred in 35 per cent, and symptomatic improvement in 30 per cent. The total dosage was 2.5 to 3.0 gm. Initial doses were 0.01 to 0.05 gm. and the maximum dosage was 0.1 gm. No ill effects were observed. The patients under gold treatment received collapse therapy when indicated.—*Therapeutische Versuche mit Goldpräparaten, S. Markovits and B. Berki, Beitr. z. Klin. d. Tuberk., June 24, 1933, lxxxiii, 85.*—(*M. P.*)

Treatment of Pulmonary Tuberculosis with Solganal.—In 1926 and 1927, 112 patients with open tuberculosis were treated with *Solganal*. Reports of 107 patients were obtained in 1932. Of these, 47.7 per cent had since died. Analyzing the late results, it is found that productive-cirrhotic lesions responded best. More or less strictly exudative processes did not respond well. The best results were obtained by treatment with *Solganal* and pneumothorax.—*Über Anfangs- und Dauererfolge nach Solganalbehandlung der offenen Lungentuberkulose, H. Hofmann, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 754.*—(*M. P.*)

Treatment of Tuberculosis with Solganal.—Solganal (Dinatrium 4-sulphomethylamino-2-auromerkaptobenzol-1-sulphoacid) has 36.5 per cent gold content. It acts on the reticuloendothelial system and the connective tissue, and leads to increased activity of the mesenchyme cells and to increased metabolism. Its bactericidal action is unimportant. Fifty-four patients with pulmonary tuberculosis were treated for 3 years. All gained markedly in weight, 12 cases improved greatly and 23 moderately, 9 were unchanged, and 11 became worse. Only 6 lost their positive sputum. As a whole the fibrotic type with only a moderate extension of lesion responded best. Twenty-two cases of laryngeal tuberculosis were also treated; 8 were improved, 2 became worse, and 12 were unchanged. Focal reactions were not observed during the treatment.—*Klinische Erfahrungen mit Solganal bei der Lungen- und Kehlkopftuberkulose, J. Ilkoff, Deutsche med. Wchnschr., February 24, 1933, lix, 292.*—(*H. S. W.*)

Inhalation Treatment with Copper Dust.—Although the copper content of several organs was considerably increased by copper-dust inhalations, no increased resistance was detected in several guinea pigs inoculated either with 0.001 mgm. of bovine tubercle bacilli, strain K5, or with a virulent trypanosome, or with the Weil-spirochaete. The amount of copper actually deposited in the cells by this method quickly decreased as the original copper equilibrium was restored. There was no noteworthy difference in the blood-picture of untreated animals and those treated with copper dust.—*Zur Frage der Resistenzfähigkeit von mit Kupferstaub behandelten Meerschweinchen gegenüber Tuberkelbazillen, Trypanosomen und Weil-Spirochäten, E. Remy, Zeit. f. Immunitätsforsch, January 30, 1933, lxxviii, 173.*—(*F. B. S.*)

Surgical Treatment of Tuberculosis.—Rest is probably the most important factor in the healing of tuberculous lesions. In their healing, walls of cavities become approximated, adherent, and eventually are replaced by fibrous tissue. This is obtained by diminution in the capacity of the hemithorax. In many cases relaxation of surrounding structures is not enough to allow obliteration of the cavities and surgical collapse is indicated. The success of artificial pneumothorax may be interfered with by localized adhesions. These may, in carefully selected cases, be severed. Phrenic evulsion, used as an independent measure or in conjunction with other procedures, is often valuable. Scaleniotomy is said to result in marked reduction of the respiratory excursion of the upper portion of the chest. Collapse of apical cavities may be obtained by apicolysis. The operative mortality of thoracoplasty has been greatly reduced in recent years.—*Surgical Treatment of Phthisis, Editorial, Brit. M. J., April 29, 1933, no. 3773, 753.*—(*T. O. R.*)

Selective Collapse Therapy.—The advantages of selective collapse over other

surgical measures in the treatment of pulmonary tuberculosis are many. It is less radical, less hazardous and more economical. Since the development of a standard extrapleural thoracoplastic operation, over 60 per cent of bed-ridden patients suitable for this operation have been able to be discharged from sanatoria. But a less extensive operation is shown here to be of equal value and less hazardous. Fully one-third of the patients, upon whom formerly a complete thoracoplasty would have been indicated, have become arrested with partial operations designed for selective collapse. There has been no extension of the disease into the uncollapsed lower lobe nor to the contralateral lung. The majority of the operations have been completed in one stage. Sections of the upper 5 or 7 ribs only have been removed. The length of rib removed is dependent upon the size of the cavity to be collapsed. In several apical cases the first rib was removed entirely and some required removal of the second rib also. Artificial pneumothorax is still the most widely useful measure of all collapse therapy and, if results are obtained, no other collapse therapy should be considered. In a selected group of patients phrenic-nerve surgery is very important. The less extensive and safer phrenic-nerve surgery is now allowed to prove its utmost usefulness before thoracoplasty is begun. It is not considered as a mere preliminary step toward thoracoplasty. Active surgical treatment of patients with tuberculosis is urged. Artificial pneumothorax, the collapse treatment of choice, is followed in order by selective extrapleural thoracoplasty and phrenic-nerve surgery.—*End Results with Selective Collapse Therapy in Pulmonary Tuberculosis, F. S. Johns, Am. J. Surg., June, 1933, xx, 737.*—(*J. F. B.*)

Selective Collapse.—Collapse therapy is indicated in two groups of tuberculosis cases: those requiring emergency collapse, such as haemorrhage or unilateral exudative lesions, and those in which collapse is a matter of choice. The latter group includes those cases which fail to respond to expectant treatment, unilateral progressive cases, and nearly all early and all latent cases with cavitation. A fixed mediastinum is required when high positive pressures are to be used in artificial pneumothorax, and this can be obtained by producing an effusion by injection of hypertonic salt solution or of one per cent gentian-violet solution in small quantities. In many instances in which thoracoplasty is indicated, it is possible, and preferable, to resect only sufficient rib, with regard both to number and length, to effect a collapse of the local lesion without putting the rest of that lung out of function.—*Eight Years of Selective Collapse for Pulmonary Tuberculosis, F. S. Johns and D. B. Cole, J. Thorac. Surg., February, 1933, ii, 247.*—(*B. B.*)

Functional Rest of Lung in Collapse Therapy.—The collapsed lung is not necessarily at functional rest, a fact which was already recognized by Muralt and others. The position of a collapsed lung changes with the phase of respiration, and some degree of aeration must be maintained as long as fluctuations of the intrapleural pressures are present and especially if the pressure during inspiration remains negative. Collapse and functional rest are sometimes used as interchangeable terms, but a collapsed lung may still take part in the respiration and, on the other hand, functional rest is possible without collapse. The movements of the mediastinum obscure respiratory changes in unilateral pneumothorax. The advent of bilateral pneumothorax stimulated the study of the anatomical and functional changes which take place in the collapsed lung. Clinical observations, as well as animal experiments, support the view that the collapsed lung is and remains under certain conditions functionally active. A small bilateral pneumothorax was induced in a guinea pig. No change in the volume of ventilation was at first noticeable, and a functional test with a 10 per cent mixture of carbon dioxide showed that the partly collapsed lungs were capable of a hyperventilation which was equal to three times the rest values. With increasing pneumothorax hyperventilation becomes more and more difficult and results in the death of the animal. The frequency of respiration increases and the depth of respiration decreases temporarily with the amount of air in the pleural cavities, to return to normal within a few hours. In another experiment the animal was placed in a plethysmograph, and it was shown that in closed bilateral pneumothorax the collapsed lungs move in proportion to the movements of the thorax. Other experiments proved that with increasing bilateral pneumothorax the arterial blood remains saturated with oxygen as long as the volume of respiration does not drop below normal. The amount of blood which is circulating in the collapsed lung in a given time was determined with Frick's method, when it was found that oxygen may disappear from the venous blood and that therefore the volume of blood is diminished. These experiments suggest that the normal collapsed lung is not at rest, either with regard to respiration or to circulation. Clinical observations also demonstrate a great degree of functional activity in the collapsed

lung. The aim of treatment is primarily the collapse of the diseased parts, while the function of the healthy portions of the lung should be maintained. It is not advisable to obtain, primarily, complete functional rest. Immobilization of the collapsed lung is however indicated in cases in which, on account of adhesions or the presence of adherent cavities, artificial pneumothorax does not result in collapse of the diseased parts.—*Ueber die Ruhigstellung der Lunge bei der Kollapstherapie, E. Brieger, Klin. Wchnschr., February 18, 1933, xli, 266.*—(*K. F.*)

Social Importance of Collapse Therapy.—Statistics of several workers emphasize the beneficial results obtained in patients treated by collapse measures over those treated by a conservative regimen. Such patients are not the menace to the community as are patients with open cavities disseminating tubercle bacilli, and are able to return to employment earlier and so spare insurance funds.—*The Social Importance of Collapse Therapy, L. O'Shaughnessy, Tubercle, April, 1933, xiv, 289.*—(*T. O. R.*)

Results of Artificial Pneumothorax.—This is a brief statistical report on the results of pneumothorax treatment at the Medical Clinic of the University of Würzburg during the years 1921 to 1931. During this period 1,801 patients with pulmonary tuberculosis were admitted, 167 of whom received unilateral pneumothorax. Of the patients treated with pneumothorax, 156 had bacilliferous sputum before the treatment, but 31 per cent of them lost their bacilli permanently. The results are presented in tabular form, and the conclusions to be drawn from this material are essentially the same as those of previous workers. The result of the treatment is dependent on the length of the preceding disease, on the period of treatment, and on the completeness of the collapse.—*Das Ergebnis der Pneumothoraxbehandlung an der Medizinischen Universitätsklinik Würzburg aus den Jahren 1921–1931, H. Horster and J. Federlein, Beitr. z. Klin. d. Tuberk., February, 1933, lxxxii, 230.*—(*M. P.*)

Renewed Artificial Pneumothorax.—Three cases are reported in whom it was possible to establish a pneumothorax again after a previous pneumothorax on the same side had been abandoned. The primary pneumothoraces lasted three years, six months and seven years respectively. The interval between the first and second pneumothoraces was eight years, nine months, and three and one-half years, respectively. Two of the cases showed many adhesions. After endopleural cautery, a satisfactory pneumothorax was established in two cases.—*Über erneute Pneumothoraxanlegung, I. Bluhm, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii, 355.*—(*M. P.*)

Complications of Artificial Pneumothorax.—The complications of artificial pneumothorax may be classified as those occurring during the induction or refill, those occurring after the induction, those due to cardiac involvement, those involving the opposite lung, those producing tuberculous disease in other organs, and those due to other general diseases. These complications are exhaustively discussed along with their prevention and treatment.—*The Complications of Artificial Pneumothorax: Their Prevention and Treatment, A. G. J. Harris, Tubercle, March, 1933, xiv, 241.*—(*T. O. R.*)

Air Embolus in Artificial Pneumothorax.—This is a brief case-report of a cerebral air embolus which occurred as soon as the needle was inserted in the pneumothorax space. The typical syndrome lasted but 20 minutes and the patient made a complete recovery. It is assumed that emboli are less likely to occur when the needle is introduced as far as possible from the hilar region.—*Ein Fall von Gasembolie im Gehirn nach künstlichem Pneumothorax, zugleich ein Beitrag zur Prophylaxe der Gasembolie, V. Kairiukschtis, Beitr. z. Klin. d. Tuberk., July 29, 1933, lxxxiii, 211.*—(*M. P.*)

Air Embolism in Artificial Pneumothorax.—Difficulty was encountered in getting satisfactory manometric readings while giving a pneumothorax refill on the right side. Finally, after readings of minus three, plus two, were obtained, a small experimental insufflation was given. There followed, almost immediately, partial loss of consciousness, convulsive movements, clonic spasm of the extremities, and conjugate deviation of eyes to the right. Then circular areas of blanching, with circumferential injection, appeared over the skin of the radial aspect of the right forearm and of the submammary region of the right chest-wall. Consciousness was quickly regained, but the conjugate deviation lasted somewhat longer. Definite relaxation of the left arm and leg was then noted. Deep reflexes were exaggerated, and ankle clonus was present on the affected side. The paretic signs passed off within twenty minutes. The skin areas changed to a marbling which persisted for an hour. Residual pallor, weakness and headache disappeared within twenty-four hours. This case was clearly one of multiple air emboli affecting the terminal distribution of

the right internal carotid, right brachial, and (probably) right internal mammary arteries. The distribution of the air in the terminal circulation of the innominate artery had a clear physical explanation, since the patient was in the left lateral position for insufflation. The entry of air into the pulmonary venous circulation despite the manometer swing, which must have been alveolar, was probably due to the positive water-pressure of the apparatus, causing air to enter an injured vein from the alveoli.—*Air Embolism during Artificial Pneumothorax Insufflation, V. R. Walker, Lancet, March 25, 1933, ccxxiv, 636.*—(*E. H. K.*)

Method of Avoiding Artificial-Pneumothorax Exudates.—Exudates in artificial-pneumothorax treatment may occur in from 10 to 70 per cent of the cases. Its occasionally observed favorable influence upon immunobiological balance does not affect its disagreeable sequelae. A large exudate compresses the lower, healthy parts of the lung. Obliterative pleuritis often brings pneumothorax treatment to an untimely end and the exudates are also dangerous in so far as they may become secondarily infected. These exudates are mostly specifically tuberculous in character and their immediate cause may be either improper technique in refills or insufficient asepsis. Most of the exudates develop in the early period of pneumothorax treatment, when the pleura is still unchanged. The fibrous thickening of the pleura later in the treatment apparently forms a barrier against haematogenous and lymphogenous infection. Efforts have been made to create this changed pleura early in the course of pneumothorax treatment. Supported by preliminary animal experiments, 2 or 3 cc. of sterile olive oil were injected into the pleural cavity of 106 fresh pneumothorax cases at the second and third air refills. In most of the patients this led to a short period of fever and thoracic pain. In all cases a small exudate developed but this was absorbed in about fourteen days. In none of these cases was the exudate marked enough to necessitate aspiration; in none had the treatment to be prematurely ended on account of adhesive pleurisy. Reëxpansion of the lung, when indicated, was complete. The fibrotic changes of the pleura was demonstrated when thoracoplasty became necessary in several cases.—*Methode zur Vermeidung von Pneumothoraxexsudaten, Unverricht and Dosquet, Deutsche med. Wchnschr., March 24, 1933, lix, 451.*—(*H. S. W.*)

Experimental Artificial Pneumothorax in Rabbits.—Hellin, in 1907, presented a large number of human cases of bilateral pneumothorax and since then the cases have accumulated. Experimental findings with bilateral open and closed pneumothorax are briefly reviewed. Upon the introduction of gas into the second side in rabbits, maintained as normally as possible, respiration changed immediately upon passing the zero pressure mark and became deep and irregular; the addition of 10 to 20 cc. of gas caused suffocation, which disappeared upon removal of the gas. Diminished air-pressure showed no effect until values of 550–570 mm. Hg were reached, when convulsions occurred and death followed. If the pressure is increased the rabbits recover in one or two minutes. Pneumothorax, unilateral or bilateral reduces animal ability to withstand diminished air-pressures, the effect paralleling the size of the insufflation. Bilateral-pneumothorax animals appear to recover more quickly than the unilateral animals. Mediastinal deviation becomes more pronounced in unilateral cases upon the reduction of air-pressure, and circulatory disturbances are pronounced. This was not the case in bilateral pneumothorax. It appears that animals with bilateral pneumothorax possess a greater resistance to reduction of air-pressure than do unilateral cases.—*Experimental Untersuchungen über Pneumothorax bei Kaninchen, A. Heymer, Ztschr. f. Tuberk., 1932, lxvi, 217.*—(*H. J. C.*)

Section of Adhesions in Incomplete Artificial Pneumothorax.—In 86.7 per cent of 136 pneumothoraces of six months' duration adhesions were demonstrated by the roentgenogram and the pleuroscope, the former alone being unreliable in revealing adhesions. Yet only 24 per cent of these 136 pneumothoraces were inefficacious, and in all but one instance was this due to adhesions. That is, 85.4 per cent of the successful pneumothoraces had some adhesions. In the 33 failures, 12 operative sections of the adhesions by diathermy combined with galvanocautery were attempted. Ten were successfully performed. In the whole series only one small effusion occurred. It is concluded that decision be reserved for six months after the institution of pneumothoraces before operative interference is decided upon, and that the decision as to operability be based on pleuroscopic examination which is an innocuous procedure.—*Pneumothorax inefficaces et sections d'adhèrences, P. Davy, Rev. d. l. Tuberc., November, 1932, xiii, 943.*—(*A. E. M.*)

Bilateral Thoraco-Cauterization.—In certain cases bilateral thoraco-cautery should be performed to close cavities. Mediastinal adhesions, preventing total collapse and thus

diminishing the danger of too great collapse, make the procedure less dangerous. In a case of bilateral disease of the upper lobes, with large cavity on the left and a smaller one on the right, effective pneumothorax treatment was prevented by adhesions, but thoraco-cautery, first on one side and then on the other five weeks later, resulted beneficially, with disappearance of bacilli from the sputum, gain in weight and general improvement. Three successful cases in all are noted.—*Über doppelseitige Kaustiken, E. Gabe, Ztschr. f. Tuberk., 1933, lxviii, 156.*—(*H. J. C.*)

After-Treatment of Cauterization of Adhesions.—Two cases are reported in which, following complete thoracocauterization of widespread endopleural adhesions, there developed dense adhesions of the lung to the chest-wall on the third or fourth day. The origin and prevention of this mishap is discussed, and it is recommended that such a case following thoracocautery should be carefully rayed and given refills. The first examinations should be performed to protect the patient, with portable roentgen apparatus if possible.—*Zur Nachbehandlung bei endopleuraler Strangdurchbrennung, Gert. Zimmerman, Ztschr. f. Tuberk., 1933, lxviii, 33.*—(*H. J. C.*)

Thoracoscopy and Thoraco-Cauterization.—After a personal experience with 147 thoracoscopies and 118 thoracocauteries, the author presents indications and results, as well as the technique of these operations. Thoracocautery was a valuable adjunct in many cases of artificial pneumothorax with adhesions and especially so since the severe sanatorium cases provide a wide field for the operative treatment of pulmonary tuberculosis.—*Über Thorakoskopie und Thoracokaustik, H. Gödde, Ztschr. f. Tuberk., 1932, lxvi, 120.*—(*H. J. C.*)

Iodine Resorption from Oleothorax.—Oleothorax with iodipin was established in a number of patients, and at various intervals iodine estimations were made of the urine and pleural fluid. The iodine resorption was minimal but varied in different patients, and persisted for a long time. In the pleural cavity iodipin undergoes saponification, and, as long as this iodipin is not saponified, its iodine content remains constant. Therefore, resorption is initiated by saponification. This iodine resorption is of sufficient magnitude to contraindicate iodipin in patients with hyperthyroidism.—*Jodresorption beim Jodipin-Oleothorax, G. v. Haffner, Beitr. z. Klin. d. Tuberk., June 24, 1933, lxxxiii, 92.*—(*M. P.*)

Artificial Pneumothorax and Phrenicectomy.—In the presence of artificial pneumothorax, phrenicectomy is indicated only when basal adhesions are present which produce tension on the pulmonary tissue. The effect of phrenicectomy is collapse of the lower part of the lung and relief from tension and immobilization of the upper part. It reduces the shifting of a weak mediastinum. —*Die Kombination Pneumothorax mit Phrenicusexairese in Theorie und Praxis, A. Behrmann, Beitr. z. Klin. d. Tuberk., July 29, 1933, lxxxiii, 158.*—(*M. P.*)

Final Results of Artificial Pneumothorax and Phrenicectomy.—Final therapeutic results were studied in 899 cases. All the patients had been under treatment in the years 1923 to 1928. The final results represent the status three years following the treatment. They are classified according to living, dead, and able to work. Control groups are available in the form of patients who declined the indicated treatment, and of those in whom pneumothorax was tried but was not successful. Pneumothorax was given to 344 patients; 298 had a phrenicectomy; there were 61 unsuccessful attempts at pneumothorax; and 170 patients declined pneumothorax or phrenicectomy. The following percentages of patients are able to work according to the indicated groups: satisfactory pneumothorax 51.4, phrenicectomy 36.1, incomplete pneumothorax with phrenicectomy 31.7, pneumothorax tried but failed plus phrenicectomy 27, patients who refused phrenicectomy 21.2, patients who refused pneumothorax 22.2, incomplete pneumothorax without phrenicectomy 25.4, failure of pneumothorax and no phrenicectomy 20.5. The results are analyzed in great detail according to the usual viewpoints. In phrenicectomy the results are considerably better in basal than in upper-lobe lesions.—*Über Dauererfolge bei Pneumothorax- und Phrenicusexaireseindikation nach Durchführung und Ablehnung der Behandlung, R. Ahlenstiel, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii, 361.*—(*M. P.*)

Indications for Phrenicectomy.—A detailed analysis of 29 phrenicectomies attempts to arrive at precise indications for the operation. We should assume a much more critical attitude than usually found in the literature, and the indications for phrenicectomy must be narrowed considerably, as is further emphasized by the various complications which may occur with the operation. The strict indications for phrenicectomy are as follows: (1) Recurrent or continuous haemoptysis, if pneumothorax, partial thoracoplasty or tamponing cannot be used. (2)

In cases in which contraindications exist against thoracoplasty or tamponing, such as too far advanced age, arteriosclerosis, bilateral disease, cardiac disease. (3) To improve the action of pneumothorax which is incomplete on account of adhesions, and only in such cases in which pneumolysis or thoracoplasty cannot be performed. (4) In patients who refuse thoracoplasty but who are willing to try phrenicectomy. Phrenicectomy should not be done in pulmonary tuberculosis with cavities, when a pneumothorax is possible, when a total or partial thoracoplasty can be done, or when a tamponing can be performed. Temporary phrenic paralysis is only in question in lesions without cavities.—*Wieweit ist die Phrenicusexairese eine Heiloperation in Rücksicht auf die nachfolgenden anatomischen und physiologischen Veränderungen und im Vergleich zum klinischen Erfolg mit den übrigen Lungen-Kollapsverfahren?—Eine enge Umgrenzung ihrer Indikation, R. Noack, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii, 397.*—(*M. P.*)

Test Operation Preliminary to Phrenic Exairesis.—The various phrenic operations, such as exairesis, crushing, freezing and alcoholic injection, leave such uncertain factors as the degree of diaphragmatic ascent and the amount of encumbrance to pulmonary function. Local anaesthesia of the phrenic nerve with a 1 or 2 per cent solution of novocaine provides a good test as to how the diaphragm will ascend on the final operation. The needle is introduced through the skin at the area in which the horizontal incision is to be made, that is, 1½ to 2 finger breadths above the clavicle, and at the lateral edge of the sternocleidomastoid muscle. When the phrenic nerve is touched, the patient experiences the usual pain in the chest and shoulder, and sometimes dyspnoea as well. The phrenic nerve is injected with 1 or 2 cc. of a 2 per cent solution of novocaine and the surrounding tissue is injected with 0.5 per cent novocaine for accessory nerves. Thus a total paralysis of the diaphragm is obtained which lasts from ½ to 2 hours, or longer. Immediately after the anaesthesia, the patient is fluoroscoped or X-rayed. No appreciable difference is noted in the degree of rise of the diaphragm after the test operation and the final exairesis. By means of this test operation, undesirable surprises, such as too high a rise of the diaphragm or the appearance of dyspnoea, due either to diminished pulmonary volume or to unrecognized cardiovascular disturbances, may be avoided. In cases in which the test operation showed only a slight elevation of the diaphragm, exairesis did not bring further improvement. Some patients, especially older people, complained, on the test operation, of dyspnoea, even when the diaphragm was but slightly elevated. In such instances no final operation was done.—*Die Phrenikusanaesthesie als Testoperation, J. Hein, Deutsche med. Wchnschr., December 23, 1932, lviii, 2028.*—(*H. S. W.*).

Place of Phrenicoexairesis.—In general artificial pneumothorax is the operation of choice in pulmonary tuberculosis. The authors' experience indicates that phrenicoexairesis works most favorably on processes in the midpulmonary regions. If favorable and satisfactory effects are not noted within two to three months, other surgical procedures are to be considered and performed to guarantee permanent results. As a test-operation crushing of the phrenic is recommended.—*Die Rolle der Phrenikusexairese im Rahmen der übrigen chirurgischen Behandlungsmethoden der Lungentuberkulose, T. Naegeli and H. Schulte-Tigges, Ztschr. f. Tuberk., 1933, lxviii, 29.*—(*H. J. C.*)

Effects of Phrenicectomy.—The benefits resulting from phrenicectomy are dependent upon the cessation of diaphragmatic excursions and upon the loss of the controlling force of intraäbdominal and intrathoracic pressures by the dome of the diaphragm. The operation is as nearly ideal as possible because collapse is effected without the introduction of a foreign-body. Phrenicectomy is indicated in pulmonary tuberculosis when artificial pneumothorax has been unsuccessful and the disease is not too extensive, when effective pneumothorax collapse is prevented by adhesions, when a haemorrhage originates in a pulmonary area capable of responding to collapse, when the disease is localized in a lobe or, if scattered throughout the lung, is of an early chronic fibrotic type, when extensive disease has healed and the contracting scar tissue causes significant distortion, when apicolysis or partial thoracoplasty are warranted. Phrenicectomy is contraindicated in cases with an associated chronic bronchitis or in conjunction with an oleothorax. Serious complications are rare. The results of phrenicectomy show some failures, a large proportion of successes, and some brilliant triumphs.—*The After-Effects of Phrenicectomy, H. M. Davies, Tubercle, August, 1933, xiv, 481.*—(*T. O. R.*)

Effects of Phrenicectomy.—The cases of phrenicectomy performed at the South Wales Sanatorium from 1928 to 1931 were essentially in well-established lesions tending to deterioration and in which the outlook was unfavorable. A statistical analysis of 116 patients operated on during this period shows

the effect to be greater in basal lesions although there was definite benefit in upper-lobe lesions without extensive or rigid cavitation. At present more hopeful types of cases are selected.—*Analysis of the Immediate Results of Phrenic Evulsion or Phrenicectomy in Pulmonary Tuberculosis, H. E. Watson, Tubercle, August, 1933, xiv, 489.*—(*T. O. R.*)

Phrenicectomy and Digestive Disturbances.—Several cases are reported and illustrated in which a left-sided phrenicectomy produced marked changes in the position of the stomach and the colon, which in their turn caused disagreeable gastro-intestinal symptoms. Comparing such ill effects with the results of the operation as far as pulmonary lesions are concerned, it is concluded that other surgical procedures are preferable.—*Fälle von linksseitiger Phrenicusexairese mit typischen Verlagerungen des Magendarmtractus, Luise Rickers, Beitr. z. Klin. d. Tuberk., July 29, 1933, lxxxiii, 175.*—(*M. P.*)

Thoracoplasty.—In performing thoracoplasty in cases with pneumothorax, hydrothorax or empyema, cognizance must be taken of the effects such noncompressible substances may have on both the degree of chest-wall collapse and the mediastinal shift. It has been recommended that such air or fluid be partially removed before and after each operation. A simple and more satisfactory method is to insert a needle or tube into the pleural space, at some point away from the thoracoplasty wound, at the time each stage of the thoracoplasty is done. By gentle pressure on the chest-wall after the ribs have been resected a sufficient amount of air or fluid can be expressed so that the usual degree of chest-wall collapse is obtained.—*Extrapleural Thoracoplasty in the Presence of Pneumo- or Hydrothorax, R. B. Bettman, J. Thorac. Surg., December, 1932, ii, 154.*—(*B. B.*)

Thoracoplasty in Bilateral Pulmonary Tuberculosis.—This is a report of 29 cases of bilateral pulmonary tuberculosis, of which 21 had total and 8 partial thoracoplasty. The results were as follows: Complete cure, 24 per cent; marked improvement, 38 per cent; unchanged, 10 per cent; late mortality, 20 per cent; and operative mortality, 7 per cent. It is emphasized that the most important and the most difficult factor in the surgery of bilateral lesions is defining the proper time for surgical interference. Partial upper-lobe thoracoplasty is particularly recommended. This operation produces minimal disturbance of the mediastinal organs; the danger of aspiration is not greater than in total thoracoplasties; the extent of the operation can be closely adapted to the extent of the lesion; and bilateral operation is available. Partial thoracoplasty is a satisfactory physiological substitute for extrapleural tamponing. It can be usually achieved as a one-stage operation. Partial thoracoplasty does not impair healthy pulmonary tissue.—*Über Thorakoplastik bei doppelseitiger Lungentuberkulose, H. Jessen, Beitr. z. Klin. d. Tuberk., June 24, 1933, lxxxiii, 61.*—(*M. P.*)

Bilateral Partial Thoracoplasty.—The author reports several cases of bilateral partial thoracoplasty attempted for apical cavities with complete adherence preventing the artificial pneumothorax. The first, a woman of 30 years of age, in whom six upper ribs were removed on the right side, died. The second case, a woman 27 years of age, proved successful, after six upper ribs were removed on the left side in January, 1931, and six upper ribs on the right side in April 1931. In spite of the fact that the second operation was complicated by pulmonary oedema the result was good and a 19-month febrile period terminated after the operations. Expectoration fell from 150 to 200 cc. to 4 or 5 cc. One year after operation the patient is remarkably improved.—*Ein mit doppelseitiger partieller Thorakoplastik behandelter Fall, J. Gravesen, Ztschr. f. Tuberk., 1932, lxvi, 53.*—(*H. J. C.*)

Complications of Thoracoplasty.—The immediate mortality from thoracoplasty is still over 10 per cent, due primarily to pulmonary and cardiac complications, such as shock, heart failure, and aspiration or tuberculous pneumonia. Other factors, such as massive absorption of toxins from the collapsed lung, mediastinal flutter, wound infection, haemorrhage and embolism, are responsible for less than 10 per cent of the number of deaths. In order to study the causes of mortality following such operations as thoracoplasty it is necessary that a more detailed knowledge of the fundamental physiological and pathological processes involved be attained by both surgeons and internists. The theory of toxic absorption of such substances as histamine as an explanation of shock must give way to the theory of anoxaemia and acapnia. Henderson and Haggard believe that shock is due to oxygen and carbon-dioxide deficiency, although the details of this explanation are still not completely understood. The anoxaemia, arising from any cause, produces rapid shallow breathing, as a result of which the CO_2 is washed out of the lung, increasing in turn the oxygen deficiency in the tissues because of

the "Bohr effect." The excessive elimination of CO_2 causes general loss of muscle-tone, of both striated and smooth muscle, one important manifestation of which is a partial functional collapse of the lung, with elevation of the diaphragm and narrowing of the intercostal spaces. From this there results inadequate ventilation and insufficient oxygenation of the blood, impaired bronchial drainage, and narrowing of the bronchi so that atelectasis or pneumonia are apt to occur. It is important to remember that death from acute anoxaemia with acapnia can easily pass undiagnosed, as it may not be associated with respiratory distress, nor with little, if any, cyanosis. Atelectasis, pneumonia, and thoracoplasty itself induce decreased ventilation, without decreased circulation in the area involved, so that blood returning to the heart is only imperfectly oxygenated. If to these factors are added peripheral stasis of blood, oxygen unsaturation may occur with, successively, rapid shallow breathing, washing out of CO_2, and thus further anoxaemia leading to anoxaemic crisis. The "veno-pressor" mechanism, which has to do with the return of venous blood to the right heart through the tonus of the skeletal muscles especially, can likewise be an important contributory factor toward the development of shock. The anoxaemic crisis produces death by action on the nerve-tissues that control respiration and circulation, and also by the effect of the anoxaemia on the heart and on the blood. The vicious cycle of underventilation and anoxaemia starts with the bronchial exudate, present before operation, but added to by compression of the involved areas during operation. The viscosity of this exudate is increased by secondary infection by pneumococci, and thus large as well as small bronchi can be obstructed. The rôle of aspiration in the development of postthoracoplasty pneumonia is generally agreed upon by most authors; and it seems that the incidence of such complications is roughly the same in the hands of various operators and little has been done to remove the cause. Another factor of importance is the inability of patients to cough or expectorate effectively for the first 24 hours after operation, because of pain and, more important, the anoxaemia and acapnia following impaired ventilation. From such considerations it seems that one of the chief causes in postthoracoplasty death is primarily anoxaemia and its sequelae, and an attempt is made to eliminate this factor as much as possible by using intratracheal anaesthesia with suction of bronchial materials during the operation. The method devised by the author is described in detail. Any type of inhalation anaesthesia can be used in this method, but the gas-oxygen-ether mixture is preferred and is given under slightly positive pressure. Suction of bronchial secretions is performed at regular intervals during the operation. The administration of CO_2-O_2 at the end of the operation and for 2 to 4 hours afterward is considered of real importance. The patchy or lobar atelectasis or pneumonia that develops postoperatively can be treated by immediate blood-transfusion, since they are caused by bronchial plugging which itself has resulted in part from anoxaemia. In turn, these plugged bronchial areas induce further anoxaemia, and the best method of breaking this vicious cycle is by an immediate supply of oxygen to the tissues by transfusion. Actually, the results of such treatment are often dramatically successful. The importance of extreme care in watching the patient for the first 48 hours is stressed. A report is made of 250 operations performed upon 133 patients, 84 patients being operated upon with intratracheal anaesthesia, the other 49 acting as a control group, in which ordinary mask anaesthesia was used. In the first group the morbidity rate was 9.5 per cent as compared with 20.4 per cent in the control group; the mortality differences were not so striking; that is, 15.5 per cent as compared with 18.3 per cent. These results corroborate the soundness of the fundamental concepts presented and justify further work along these lines.—*Etiology, Prevention and Treatment of Postoperative Haemorespiratory Complications in the Surgical Treatment of Tuberculosis. Endotracheal Anaesthesia Combined with Bronchial Suction. (84 cases—152 operations), P. N. Coryllos, J. Thorac. Surg., April, 1933, ii 384.*—(*B. B.*)

Total Resection of First Rib.—It is advocated that in all partial thoracoplasties the first rib should be resected completely. Instruments and a technique are described to facilitate this procedure.—*Zur Totalresektion der 1 Rippe, H. Kleesattel, Beitr. z. Klin. d. Tuberk., April, 1933, lxxxii, 570.*—(*M. P.*)

Thoracoplasty or Pneumolysis.—In the Northern countries and in America, thoracoplasty occupies a definite place in the treatment of pulmonary tuberculosis and is widely employed. In Latin countries, either because of the critical attitude of the patients or because local physicians are not cognizant of the value of surgical collapse therapy, the number of thoracoplasties performed is very small. The indication has not been for an elective operation but rather as a remedy of last resort. The results have therefore been poor and on this account pub-

lic opinion is not in favor of such a procedure. In the S. Luigi Sanatorium of Torino, 50 patients were operated upon for tuberculosis within 6 years. During the past fifteen months none were operated upon. Thoracoplasty, therefore, though theoretically and technically perfected, occupies a negative position because patients will not accept it for prejudicial and psychological reasons. Physicians ignore it or misunderstand it because they have had little opportunity to see the good results that may be obtained and to them it remains an operation of mystery with serious consequences. During the six years of practice in the surgical treatment of pulmonary tuberculosis, apicolysis was never performed because thoracoplasty was considered the best procedure in any case requiring surgical intervention. In apicolysis the factors involved are not under the direct control of the surgeon and irremediable damage may be done. During the past year, however, apicolysis was done in 12 cases. The paraffin, if limited to 200 or 250 gm., cannot of itself be the direct cause of the poor results thus far obtained. The essential factor lies in properly selecting the cases for operation. The block of paraffin occupies a limited space and unless its compressing action is applied to the entire diseased area, damage to the surrounding tissues will result. The cases for apicolysis should be rigorously chosen. It should not be used as a substitute measure in patients refusing thoracoplasty. In the ideal patient for this operation there should be a localized apical cavity with well-fibrosed walls, no larger than a small egg, not easily ulcerable by the paraffin nor readily vulnerable by the surgical procedure and the rest of the lung must be free from disease. Such cases are rare. The use of paraffin in larger amounts than 300 gm. has been abandoned, and apicolysis has been discarded also. In patients not suitable for apicolysis or thoracoplasty, total extrapleural pneumolysis may be performed. It should not be done in individuals suitable for pneumothorax or phrenicoexairesis. In order to be successful it must be total so that no refilling will be required. If the entire lung is stripped from the chest-wall, theoretically at least, reëxpansion will be problematical and, if it does occur, the process will be very slow. In this operation considerable bleeding occurs in the extrapleural space, a coagulum forms with serosanguineous effusion. The exudate in conjunction with the air entering the space during the operative procedure, will exert enough force to prevent pulmonary reëxpansion. The reactive postoperative effusion may be rendered more abundant by introducing a small amount of lipiodol before closing the wound. The oil will not only irritate the pleura and stimulate exudation, but will serve as an excellent contrast medium for further radiographic studies. Homologous blood may be injected for the same purpose. Technically the operation presents few difficulties. It is sometimes impossible to completely separate the lung from the diaphragm, and in such cases a preliminary phrenicectomy is advisable. With an anterior and midaxillary incision pneumolysis may be performed under local anaesthesia, without pain or shock. If the therapeutic results are not satisfactory because of insufficient collapse or a tendency toward too rapid reëxpansion, thoracoplasty may be performed with greater ease and less danger, because the patient will have already become accustomed to respiratory and circulatory disequilibrium.—*Toracoplastica o pneumolisi, A. Jachia, Lotta contro la tuberculosi, November, 1932, iii, 1159.—(U. E. Z.)*

Closed Pneumolysis.—Of all the cases in which artificial pneumothorax is indicated maximum collapse is interfered with in about 50 per cent by pleuritic adhesions. In approximately 10 per cent, the induction of air is prevented by adherent pleural surfaces. Of the remaining 30 to 40 per cent, satisfactory collapse is obtained except for localized areas; and one-third to one-half of these (thus about 10 to 20 per cent of all cases in which artificial pneumothorax is indicated) are suitable for intrapleural pneumolysis. These adhesions interfering with adequate collapse can be stretched by high intrapleural pressures, but such a procedure greatly increases the incidence of spontaneous pneumothorax and of pleural effusions. Open pneumolysis has also been used but, because of its attendant dangers, such as mediastinal flutter and empyema, has not met with nearly as much favor as the closed method. Thoracoscopy is indicated in cases in which adhesions interfere with a satisfactory collapse, those in which satisfactory collapse has been obtained but only after use of high pressures, and in cases in which organization of adhesions and resulting contraction expand a once satisfactorily collapsed lung. There are almost no contraindications to closed intrapleural pneumolysis. In selecting cases for the operation, stereoscopic X-ray films are of great value, but it must be remembered that diagnosis from them of pleural adhesions is far from satisfactory, and thoracoscopy must be resorted to, in order to accurately ascertain the number, type and location of adhesions. The technique of choice is the electrosurgical method, preceded by electrocoagulation, as described by Matson. Adhesions may be classified as string adhe-

sions, which are often of little importance, cord adhesions which often are clinically significant, band adhesions which may attain considerable size, fan-shaped adhesions which have a narrow pulmonary attachment and are easy to cauterize, cone-shaped adhesions which have the broad attachment on the lung and often contain prolongations of pulmonary cavities, spool-shaped adhesions which are combinations of the fan and cone types, and curtain-like adhesions which have resulted from an interlobar or a diffuse pleuritis. In some of these the distinction between lung and adhesion is distinct; in others differentiation may be difficult. The important dangers of severing adhesions are haemorrhage and damage to the pulmonary parenchyma. Following pneumolysis, pneumothorax must be carefully carried out, with frequent refills and the maintenance of negative pressures. Of 26 cases subjected to pneumolysis, 12 developed effusion, 2 tuberculous empyema, 6 pyogenic empyema, 4 spontaneous pneumothorax, 1 obliterative pneumothorax, 2 pleurocutaneous fistula, and one haemorrhage. Five cases required secondary major thoracic surgery. Of the 26 cases, all of which had been considered practically hopeless, satisfactory collapse resulted in 16 following pneumolysis. Some of the cases were technically successful but clinically failures, and *vice versa.*—*Closed Intrapleural Pneumolysis in the Artificial Pneumothorax Treatment of Pulmonary Tuberculosis, J. H. Forsee, J. Thorac. Surg., February, 1933, ii, 270.*—(*B. B.*)

Pneumolysis and Haemorrhage.—The best way to prevent haemorrhage from pleural adhesions severed during the Jacobaeus operation is by the high-frequency current, following preliminary electrocoagulation. The equipment for this procedure is expensive, however, and therefore not universally available; as a substitute the use of the galvanic cautery with only a "cold" tip is advocated. Another method is the application of small silver clips through the thoracoscope to the adhesion before severing, which can then be done either by scissors or by cautery. In two cases in which such silver clips were applied, satisfactory results were obtained, and only slight amounts of fluid formed subsequently in the pleural cavity. A small transilluminating light inserted through the intercostal cannula, which is later to carry the clip applicator and scissors, can be of considerable aid in orientation and in the demonstration of both blood-vessels and cavities in the adhesions, especially when the thoracoscope light is turned off.—*The Silver Clip Method of Preventing Hemorrhage while Severing Intrapleural Adhesions, N. Bethune, J. Thorac. Surg., February, 1933, ii, 302.*—(*B. B.*)

Instrument for Intrapleural Pneumolysis.—This is a description of an instrument for intrapleural pneumolysis, using a high frequency current. A special electrode is advocated with which adhesions can be coagulated and cut. This permits of a completely bloodless operation.—*Ein Instrument zur Kombinierten Koagulation und Durchtrennung von Lungenadhäsionen im Pneumothorax mittels des Hochfrequenzstromes, G. Leendertz, Beitr. z. Klin. d. Tuberk., January, 1933, lxxxii, 128.*—(*M. P.*)

Extrapleural Apicolysis.—A surgical technique is described as useful in those pneumothoraces instituted for upper-lobe lesions which fail to accomplish their purpose because of adhesions usually found just above the involved parenchyma. The procedure is accomplished in two stages. First, after a paravertebral incision, 6 or 7 cm. of the 3rd or 4th ribs are removed. The parietal pleura is then peeled off the summit of the thoracic cage digitally down to the level of the pneumothorax, the cavity being tamponaded until haemostasis is procured. The second stage consists of pleurotomy followed by intrapleural section of the adhesions. If this procedure is successful, the superior lobe will completely collapse into the thoracic cavity. Great care is then taken to close the pleurotomy opening as exactly and as strongly as possible to avoid subsequent subcutaneous emphysema. On the 8th or 9th day the serosanguineous effusion which almost invariably follows is aspirated and replaced with air to a positive pressure. In a fair proportion of cases it is possible afterward to maintain the pneumothorax as long as is desired. If however the growth of new adhesions reduces the pneumothorax, oil of gomenol may be utilized to prevent this, although this recourse is avoided unless inevitable. This operating scheme is indicated whenever only a few accessible apical adhesions prevent a complete collapse. It is not recommended for adhesions extending below the 3rd or 4th ribs, or in the presence of symphysis to the mediastinum. The operation should be carried out before the adhesions become too thick, preferably about three months after the institution of the pneumothorax. The postoperative complications resemble those of other forms of collapse therapy, namely, elevation of temperature, pleural effusions usually serosanguineous, and later obliteration of the pleural cavity, usually from below upward by new adhesions. The sequel most to be feared is subcutaneous emphysema. This operation,

which is not a simple one, but whose indication is strictly circumscribed, was performed in 26 cases without fatality, and in each one collapse of the upper lobe was obtained and maintained, with or without oil of gomenol, for at least two years. Twelve of these cases are reported in detail.—*L'apicolyse extrapleurale au service du traitement par pneumothorax artificiel, J. Sebestyén, Rev. d. l. Tuberc., February, 1933, 135.*—(*A. E. M.*)

Extrapleural Plombage.—Experience with this operation in 50 cases is made the basis for a discussion of its technique and results. Extrapleural plombage, inaugurated by Baer, is useful for collapsing a cavity when pneumothorax or phrenicectomy has failed and thoracoplasty is not advisable. Formerly performed often, the operation fell into disrepute because of wrong indications and technique. Choice cases for the operation are those with a fibrocavernous type of disease localized in the apex, with the general health still good, and when severe interference such as thoracoplasty is not warranted. The operation may be done with safety in bilateral disease. The cavity in any case should not be larger than a small apple. The object is not to collapse the cavity mechanically by actual compression, but rather to allow its closure by encouraging its own natural tendency to retract. For complete apicolysis a posterior incision is necessary, for with an anterior incision it is more difficult to detach the apex properly. The incision is made obliquely over the third rib, following the direction of the fibres of the trapezius. About one and one-half inches of the third rib are resected, the index finger is inserted, and the lung is cautiously peeled out of the apex. The best layer of cleavage usually is found by following the third rib laterally. The apex should be freed completely, not excepting the surface toward the mediastinum. When the apicolysis is complete the apex of the lung will have fallen down and have formed a horizontal floor upon which the paraffine plug will lie. The extrapleural space should be dried and all oozing stopped. Then the space is packed loosely with as little paraffine as possible, in the form of small "sausages," just enough being introduced to keep the lung from reëxpanding. The plugs of paraffine should be pressed gently against the ribs, but never against the lung surface. The authors have never used more than 150 gm. of paraffine, even for the largest plombage. The aim is to create a perfect apicolysis, the sole function of the paraffine being to maintain the collapse obtained. The wound is closed with layers of catgut, and the skin with a silk suture. The slightest infection is a probable cause of complete failure. In the 50 cases in this series there has not been any suppuration, perforation of the lung, extrusion of the paraffine or other reaction except occasional mild fever. Two cases are reported, as follows: (1) a simple case with a small cavity, done in one stage, and (2) a difficult case, requiring two stages. In the latter case a combination of anterior and posterior incisions was used. The cavities were closed in both cases.—*Extrapleural Plombage, B. Hudson and F. Haeberlin, Lancet, May 27, 1933, ccxxiv, 1115.*—(*R. M. F.*)

Apicolysis.—Of 49 patients with large upper-lobe cavities, on whom apicolysis was performed (in three bilaterally), there were 3 that died as a result of operation. Of 22 operated upon and observed over one year, ten became sputum-negative. The findings warrant recommending the use of apicolysis in cavernous upper-lobe tuberculosis in cases in which artificial pneumothorax cannot be executed and thoracoplasty is contraindicated. Technically, the inner periosteum should be removed, as far as possible, from the ribs.—*Anfangsresultate nach Oberlappenplombierung, W. Kremer and J. Beitz, Ztschr. f. Tuberk., 1932, lxvi, 177.*—(*H. J. C.*)

Apicolysis with Paraffine Plombage.—The technique of this operation as practised by the author is described in great detail and illustrated by fifteen figures. The indications for it are not discussed. The operative technique aims to separate the pulmonary apex from the summit of the thoracic cage through the endothoracic fascia, a natural cleavage plane which passes beneath the important vessels and nerves of the vault of the thorax. A cavity not in excess of 300 cc. is thus created and filled with paraffine. The aim is to allow retraction of the lung and to prevent reëxpansion and not to exert pressure. The prime technical precautions are (1) the most rigid asepsis especially as regards the paraffine, (2) the most rigid haemostasis, and (3) as little disturbance as possible to the muscles which must subsequently present a strong wall to the paraffine pack.—*Technique de l'apicolyse avec plombage paraffiné, H. Fruchaud, Rev. d. l. Tuberc., March, 1933, i, 225.*—(*A. E. M.*)

Pneumothoracocentesis.—Seventeen patients suffering from exudative pleurisy were aspirated and a moderate amount of air was introduced into the chest concomitantly with the withdrawal of the fluid. By this method large amounts of fluid were removed with no ill effects to the patient. The quantity of air introduced was deter-

mined by the tolerance of the patient. Usually much less air was introduced than there was fluid removed. In only 3 patients was it necessary to puncture a second time. In the remaining 14 patients, no reaccumulation of fluid was observed after pneumothoracocentesis and after a brief period they were able to leave the hospital. In the majority of cases there was a rise in temperature following the treatment lasting from two to seven days. There were no visceral symptoms. This method of treatment is preferable to the ordinary process of aspiration employed in cases of pleurisy with effusion.—*Contributo clinico alla pneumotoracentesi, A. Nelli, Lotta contro la tubercolosi, December, 1932, iii, 1309.*—(*U. E. Z.*)

Sympathetic Ophthalmia.—It is likely that sympathetic ophthalmia is only a special case of a general law, according to which metastases occur with preference in the same type of tissue as the primary lesion. A possible explanation for this fact is the assumption that in a highly specific tissue specific split-products are produced by bacterial invasion, and that they, in their turn, sensitize the homologous organ. The frequency of bilateral renal tuberculosis is quoted in support of this theory. If the primary focus is formed in an organ which is relatively immune to tuberculosis, then increased immunity of all organs is produced. If the first focus occurs in a susceptible organ it is likely that metastases will occur to homologous tissue.—*Die sympathische Ophthalmie, ein Einzelfall des Gesetzes der sympathischen Entzündungen, E. Loewenstein, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 770.*—(*M. P.*)

Cervical Rib.—Cervical ribs causing vascular complications are rare. A case is reported in which a thrombosis resulted from arterial spasm, induced by continued irritation of those sympathetic nerves which supply the artery. That compression of the subclavian artery against the cervical rib was not the actiological factor was confirmed at operation. In this case the thrombus was absorbed following the removal of the rib.—*Cervical Rib with Vascular Complications, R. L. Newell, Brit. M. J., May 6, 1933, no. 3774, 782.*—(*T. O. R.*)

Thymus.—The effects of the hyperplastic gland cannot be explained entirely by the physical encroachment. The paroxysmal and prodromal reactions point to some other unknown inherent action. Spontaneous involution may occur. High-voltage technique in treating benign thymic hyperplasia is the preferable method. Recurrences are probably the result of insufficient treatment. Radium therapy, while efficacious, may be followed by marked reactions.—*The Thymus, L. J. Friedman, Radiology, May, 1933, xx, 380.*—(*T. O. R.*)

Cardiac Asthma.—The authors present a study of the dynamics of the peripheral and pulmonary circulations in cardiac asthma: and the relation of the circulation to clinical symptoms and signs of left ventricular failure and to the mechanism of asthmatic attacks is described. Eighty-two patients with severe paroxysmal dyspnoea were studied, 53 per cent suffering from primary or secondary arterial hypertension; 20 per cent from vascular sclerosis, particularly of the coronary arteries, but without pronounced elevation of the arterial pressure; 20 per cent from syphilitic heart disease; 6 per cent from rheumatic heart disease, and in one case the type of heart disease could not be determined. In practically all the cases studied there was clinical and laboratory evidence of hypertrophy of the left ventricle or coronary disease, or both. Whereas the peripheral circulation between attacks of cardiac asthma is usually normal, the pulmonary circulation exhibits engorgement and evidence of pulmonary hypertension. Simultaneous measurements of the lung volume and its subdivisions, and the pulmonary circulation between attacks reveals a functional pulmonary emphysema caused by disturbance of the pulmonary circulation. With improvement, the pulmonary circulation first becomes normal, followed by disappearance of the functional emphysema. In the precipitation of attacks, the coexistence of subacute failure of the left ventricle and acute contributory factors is essential. Acute pulmonary hypertension, a secondary intense functional emphysema, and pulmonary oedema are the main features of the attacks. The volume of the blood-flow through the lungs is normal or decreased, the velocity usually decreased. The pulmonary rather than the peripheral circulation is related to orthopnoea.—*Cardiac Asthma (Paroxysmal Cardiac Dyspnea) and the Syndrome of Left Ventricular Failure, S. Weiss and G. P. Robb, J. Am. M. Ass., June 10, 1933, c, 1841.*—(*G. L. L.*)

Anergy to Tuberculin in Cardiovascular Disease.—In a group of 20 children, mostly under eleven years of age, with characteristic cardiovascular disease, skin lesions were found three times, which, from appearance, localization and course, were diagnosed as typical papulonecrotic tuberculides. Quantitative intracutaneous tests with the usual dilutions of Old Tuberculin

revealed a marked anergy which was in striking contrast to the high percentage of positive reactors, which is commonly observed in this age-group of an urban population. The frequency of tuberculides in polyarthritis has been described by several authors, and raises the question of a causative relationship between the two diseases. The anergy which was found in this group does not necessarily speak against tuberculosis and several explanations are considered, the most plausible being that in certain forms of tuberculosis of the skin, such as sarcoids or *lupus pernio*, a positive anergic phase is responsible for the hyposensitiveness to tuberculin.—*Rheumatische Herz- und Gefässerkrankungen, Papulonekrotische Tuberkulide und Tuberkulin-Anergie, M. B. Sulzberger and E. Feit, Klin. Wchnschr., February 4, 1933, xli, 189.*—(*K. F.*)

Perforation of Aneurysm into Pleural Space.—*Case Report:* A man, 30 years old, admitted with tuberculous empyema following artificial pneumothorax, had a high temperature and the exudate increased so as to produce pressure symptoms. He was then treated by thoracocentesis, washing of the pleural cavity with physiological salt solution, and the injection of 450 cc. of 5 per cent gomenol-paraffine. About six weeks later he complained suddenly of intense dyspnoea and pain in his chest. Since the exudate had increased, 500 cc. of air was withdrawn, but, fluid-level rising again, the fluid was found to be haemorrhagic; and eleven days after onset of the acute symptoms the patient died. Autopsy disclosed that the haemorrhage was due to rupture of a small aneurysm of the left subclavian artery, eroded by caseous processes contiguous with the massive caseation of the entire pleura.—*Perforation eines Aneurysmas der Arteria subclavia sinistra in den Pleuraraum, A. Sattler, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 792.*—(*M. P.*)

Pericardial Effusion.—The determination of moderate quantities of fluid within the pericardial cavity by physical diagnosis is too often indecisive. Even roentgenological diagnosis is not infallible. The conjunction of three signs is usually conclusive in determining the diagnosis of pericardial effusion: (1) widening of the area of cardiac flatness, (2) abrupt transition from pulmonary resonance to cardiac flatness and (3) widening of the cardiac dulness in the second intercostal space. No one of these signs, taken singly, is conclusive, but together they form a triad which is thoroughly reliable, as confirmed by roentgen examination or at autopsy. The second sign, namely the abrupt transition of pulmonary resonance to cardiac flatness, is due to the practical disappearance of the lung-filled angle between the heart and the anterior wall of the chest owing to the greatly dilated pericardial sac. The acuteness of the angle subtending the border of the lung and the extreme edge of the pericardial sac determines the area of cardiac dulness. In pericardial effusions, the normal circumferential zone of cardiac dulness becomes reduced to almost nothing, and the abrupt transition of pulmonary resonance to flatness is the consequence. To determine this sign, deep percussion is essential.—*A New Sign of Pericardial Effusion, E. Moschcowitz, J. Am. M. Ass., May 27, 1933, c, 1663.*—(*G. L. L.*)

Pernicious Anaemia and Tuberculosis.—In order to determine the frequency of tuberculosis with pernicious anaemia in a large series of cases, the postmortem records of more than 16,000 autospies, performed from 1920 to 1932, inclusive, in the Department of Pathology at the University of Minnesota Medical School were examined. In this series, 93 cases of pernicious anaemia were found. All of these were strikingly free from active tuberculosis. Ten of them showed chronic adhesive pleuritis, of which undoubtedly a high percentage was tuberculous, but the lesions were all healed. There were 3 cases of arrested or healed nonclinical pulmonary tuberculosis and one case of healed miliary pulmonary tuberculosis. In the entire series of 93 cases there were present only two cases of active tuberculosis, and both of these were acute generalized miliary tuberculosis, which was the direct cause of death in these patients. The absence of active chronic pulmonary tuberculosis is very striking. Previous studies by others on the incidence of tuberculosis combined with cancer indicate also that active tuberculosis is much less frequent in persons with cancer than in the general postmortem series. Nevertheless the two conditions are not infrequently found combined. However, comparing age-periods for the incidence of tuberculosis, cancer and pernicious anaemia, while the greatest incidence of pernicious anaemia occurs earlier than that of cancer and therefore during a period when tuberculosis is still relatively frequent, it is remarkably striking that the 93 cases of anaemia studied did not present a single case of chronic pulmonary tuberculosis and only 2 cases of miliary tuberculosis. It is obvious that cases of miliary tuberculosis present a type of acute infectious disease spread by the blood-stream altogether different from

chronic pulmonary tuberculosis. The factors of immunity and resistance are entirely different in the two diseases. It is therefore not unreasonable to conclude, both from a review of the literature and from study of a large series of postmortem cases, that chronic progressive pulmonary tuberculosis is only on the rarest occasions associated with pernicious anemia.—*Pernicious Anemia and Tuberculosis: Is There an Antagonism? A Review of the Occurrence of Tuberculosis in Ninety-three Cases of Pernicious Anemia as Found in 16,600 Postmortem Examinations, with a Report of Two Clinical Cases, M. Barron, J. Am. M. Ass., May 20, 1933, c, 1590.*—(*G. L. L.*)

Tuberculosis and Diabetes.—The combined figures of Joslin, the Mayo Clinic, and Brigham Hospital, covering 5,000 cases of diabetes, show an incidence of tuberculosis of 1.8 per cent. In 408 unselected cases out of a diabetic-clinic group of 500 at the Rhode Island General Hospital, X-rays revealed tuberculosis in 5, or 1.2 per cent. Apparently the incidence of tuberculosis is no greater in diabetics than in nondiabetics. Four of the 5 cases observed have a good prognosis, and no case was encountered of the bronchopneumonic type reported by Sosman and Steidl as characteristically occurring in diabetics.—*The Incidence of Tuberculosis in Diabetes, L. I. Kramer and H. A. Lawson, Ann. Int. Med., May, 1933, vi, 1426.*—(*R. D.*)

Positive Blood-Cultures in Nervous Diseases.—In this article Loewenstein describes the development of his culture-method for circulating blood, beginning with his first attempts in 1905 up to his present improved technique, which is given in detail. The frequency of bacillaemia in tuberculosis was demonstrated by the high percentage of positive blood-cultures in various forms of metastatic tuberculosis. The results obtained in collaboration with Reiter in cases of acute polyarthritis was even more surprising. In 70 per cent typical colonies of tubercle bacilli were cultured from the blood, and in cases of chronic primary polyarthritis, too, tubercle bacilli were demonstrated in the circulating blood as well as in intraärticular fluids. In order to determine the clinical significance of bacillaemia in skin diseases of tuberculous origin, a study was made of numerous cases by repeated examination of the blood. Together with Kren, Loewenstein reported 100 per cent positive results in *lupus erythematodes*. He then took up the study of diseases which are closely related to acute polyarthritis, such as tonsillitis and chorea. In the first series of 50 cases in which tonsils and blood were examined simultaneously, the tonsils were positive in 12 instances, the blood eight times, and both in two cases. It is assumed that the aetiology of polyarthritis depends on three factors: the presence of tubercle bacilli in the circulating blood, increased allergy and increased permeability of the blood-vessels due to infection, or thermic trauma. It is noteworthy that the tuberculin reaction is mostly negative at the time when bacilli are demonstrable in the circulation, a skin anergy which is compared to that observed in acute miliary tuberculosis, meningitis and the terminal stages of pulmonary tuberculosis. When the tubercle bacilli disappear from the blood-stream a high degree of allergy is frequently noticeable. The author therefore differentiates the anergic bacillaemia, in which symptoms of sepsis predominate, from the allergic type which is characterized by the formation of foci, and claims that tuberculosis should be diagnosed if tubercle bacilli are demonstrated in the circulating blood, regardless of whether or not structural characteristics in the tissues can be found. The tissue reaction depends on many factors, such as dose and virulence of the infecting microbes, immunity, time of examination, local resistance of the involved organ, and portal of entry. Both in the initial stage and in healed lesions nonspecific tissue reactions predominate and the structural changes which are considered typical for tuberculosis are only a facultative phase in the course of pathomorphological changes which are caused by the tubercle bacillus. In *lupus erythematodes*, for instance, no typically tuberculous tissue can be found and, nevertheless, blood-cultures have been positive in all cases. It must therefore be assumed that in certain forms of tuberculosis, which present the picture of acute or chronic sepsis, with or without fever, no formation of tuberculous tissue takes place. Accordingly the field of examination was widened and dementia praecox was next studied, because its frequent association with pulmonary tuberculosis suggested a causative relationship of the two diseases. In the first group of 359 cases of dementia praecox, 142 positive blood-cultures were obtained. Multiple sclerosis, which then was investigated, yielded positive results in 47 patients, only seven of whom had a coëxisting pulmonary tuberculosis. Finally, of 6 cases of *neuritis retrobulbaris* tubercle bacilli were cultured from the blood in 4 instances. The frequent invasion of bacilli into the circulation suggests that tuberculosis affects very often the blood-vessels, and causes the formation of tubercles in the intima, which must be considered the source of bacillaemia.

The demonstration of tubercle bacilli in the circulating blood is a more conclusive proof of tuberculous aetiology than immunobiological reactions or the presence of tuberculous tissue.—*Ueber Tuberkelbazillaemie bei Nervenkrakheiten, E. Loewenstein, Wien. klin. Wchnschr., February 24, 1933, xlvi, 228.*—(*K. F.*)

Polyarthritis and Tuberculosis.—There are undoubtedly cases of tuberculous polyarthritis, but only the demonstration of tubercle bacilli in the intraärticular fluids or a focal reaction in the affected joints is conclusive for tuberculosis as the aetiological factor. The differential diagnosis usually presents no difficulties because tuberculosis affects mostly only one or very few joints. The possibility must be borne in mind that a mild haematogenous dissemination may give the picture of acute polyarthritis, and result in the involvement of one joint after the general systemic symptoms have subsided. Another rare occurrence is a coexisting rheumatic infection which may activate a latent tuberculosis. With the exception of these rare cases there is no evidence of a causative relationship between tuberculosis and polyarthritis. Old healed lesions are commonly found, but far-advanced or active tuberculosis is, as Poncet and others have pointed out, extremely rare in chronic polyarthritis. The examination of fluid from joints yielded in 50 cases negative results. In no case could tubercle bacilli be demonstrated on direct smears or by culture methods. Cultures from the circulating blood according to Loewenstein were likewise negative in 25 cases of subacute or chronic polyarthritis. If Loewenstein's findings are correct, it must be assumed that the presence of tubercle bacilli in the blood does not prove the tuberculous nature of various conditions that are not related to tuberculosis. Loewenstein's findings have however not been confirmed by numerous investigators who have used the same method. Intracutaneous tuberculin tests were done in 58 cases, and gave frequently a marked local or general but never a focal reaction. Finally immunobiological methods, like the precipitation reaction of Lehman-Facius or the complement-fixation test with the modification of Goldenberg, failed to indicate that tuberculosis plays a part in the aetiology of polyarthritis.—*Gelenksrheumatismus und Tuberkulose, A. Fischer and H. Hennes, Klin. Wchnschr., October 1, 1932, xl, 1675.*—(*K. F.*)

Benign Osteomyelitis of Spine.—A study of 17 cases of osteomyelitis of the spine, in eleven of which a diagnosis was made of tuberculosis, indicated that osteomyelitis of the vertebral bodies occurs quite frequently in a comparatively mild form which may easily be mistaken for tuberculosis. The bodies of the vertebrae were involved in 14 and the posterior arches in 3 instances. The average age at the onset of the infection was 29.5 years. This is a distinct point of difference from tuberculosis of the spine, which usually begins in early childhood. The lesions tended to be grouped in the middorsal and midlumbar regions. The recognition of the condition offers no particular difficulty in the fulminating cases nor in those with posterior-arch involvement, often with abscesses and sinuses. It is the type with lesions in one or more bodies, with only slight or moderate elevation in temperature and with pain that may be described as being little more than a backache, which may be overlooked entirely or diagnosed as tuberculosis. The onset was sudden in 13 cases and gradual in four. Pain was the outstanding symptom in all. It was not relieved by rest. In this respect the symptoms were unlike those of tuberculosis of the spine. Physical examination disclosed a kyphos in only 3 cases, and in none was it as prominent as in the average case of tuberculosis of the spine. This is accounted for by the fact that there rarely ever is as much destruction of the vertebral bodies in osteomyelitis as in Pott's disease. As in tuberculosis, one of the earliest evidences of osteomyelitis in the roentgenogram is a thinning of the intervertebral disk. A slight haziness and indistinctness of the bony structure also may occur quite early. Especially in the dorsal region, a fusiform paravertebral abscess shadow, resembling that in tuberculosis, is to be seen in the roentgenogram. These lesions have a marked tendency, shown by later roentgenograms, to cause spontaneous bony fusion of the vertebral bodies. A study of the after-results of those patients in whom a fusion of the spine was performed indicates that this condition of benign osteomyelitis should be treated conservatively until it is certain that a cure will not result in this way.—*A Benign Form of Osteomyelitis of the Spine, A. DeF. Smith, J. Am. M. Ass., July 29, 1933, ci, 335.*—(*G. L. L.*)

Family Erythema Nodosum.—Bibliographic evidence is reviewed to show that the tuberculous nature of family erythema nodosum is gaining recognition. At least two-thirds of those presenting this lesion subsequently develop frank clinical tuberculosis. The pathology of the lesion agrees with this concept. The lesion may be reactivated by tuberculin. Pirquet and intracutaneous tests are frequently strongly positive subse-

quent to the onset of the disease. Arloing and Dufourt have demonstrated the presence of tuberculous virus in the blood of those afflicted with this disease, and Loewenstein has been able in 12 out of 14 cases to culture tubercle bacilli from the blood. Observations on two families are here reported in which 11 cases of erythema nodosum occurred, 8 in females and 3 in males. The prodromal symptoms lasted 6–8 days, the eruptions at least 20 days. In each family there was a tuberculous focus, and each case showed some evidence of tuberculous infection. It is thought that probably this disease is a manifestation of a primary tuberculous infection, and that the incubation period possibly coincides with the ante-allergic period following such infection.—*Érythèmes noueux familiaux et contaminations tuberculeuses, Parisot and Saleur, Rev. d. l. Tuberc., February, 1933, i, 126.*—(*A. E. M.*)

Undulating Fever in Tuberculosis.—Five temperature curves illustrating an undulating type of fever occurring in tuberculosis are presented. The peaks of the successive rises occurred three to four weeks apart. The possibility of complicating *Brucella* infection was ruled out in each case. From three of these 5 cases tuberculous virus was isolated, by successive guinea-pig passage, and from a lymph node, cutaneous nodule and the blood. It is contended that each of the 5 cases represents a virus septicaemia, and that the undulating character of the fever parallels developmental stages in the cycle of development of the tubercle bacillis. —*Fièvres ondulantes et ultravirus, Mazet, Rev. d. l. Tuberc., April, 1933, i, 390.*—(*A. E. M.*)

Monilia Infection.—In Jersey during 1932, 568 patients had their sputum examined by both direct and cultural methods. The specimens of 103 patients contained tubercle bacilli, of 294 patients monilia, and of 171 patients neither tubercle bacilli nor monilia. Beside frequent association with pyogenic organisms, monilia has a mechanical action because of its local growth on the mucous membrane. This may result in a bronchiectatic condition, when affecting mainly the bronchial tree, or in occlusion and collapse of the alveoli with consequent cavitation, when affecting mainly the lungs. Monilia infection gives rise to allergic cutaneous reactions. Such reactions are known to occur also in hay-fever, asthma, nontuberculous bronchopulmonary lesions, and in tuberculosis. A common factor in all these diseases is the presence of an acid-fast substance in their respective causal microörganisms. It is suggested that this acid-fast substance is the foreign protein which is responsible for allergy.—*A Note on Monilia Infection of the Respiratory Tract, P. J. Marett, Brit. M. J., May 27, 1933, no. 3777, 917.*—(*T. O. R.*)

Immunization of Tuberculous Children against Diphtheria.—One hundred and thirty Schick-positive children suffering from surgical tuberculosis and other conditions in two orthopedic hospitals were successfully and rapidly immunized against diphtheria. The Moloney test (intradermal diluted toxoid test) was used to detect children sensitive to toxoid. Very delicate children were immunized with toxoid-antitoxin floccules irrespective of their Moloney response, those who were Moloney positive received the same, while those Moloney negative received formol toxoid. The usual course was three injections of 1.0 cc. given at fortnightly intervals. No troublesome local or general reactions occurred in any of the children. With formol toxoid, over 96 per cent were immune within two to four weeks of the third injection.—*Immunisation of Tuberculous Children against Diphtheria with Formol Toxoid, H. J. Parish, Lancet, May 20, 1933, ccxxiv, 1063.*—(*R. D.*)

Occupational Asthma.—Asthma may be due to selective sensitivity acquired by frequent contact with particular allergen. Of 189 cases of asthma drawn from the district of Great Britain where the woolen industries are the largest, 119 cases, or 62.9 per cent, had positive skin reactions to various allergens. Sensitivity to sheep-wool was found in 18.4 per cent of the 119 cases and was one of the commonest types of sensitivity, standing fourth in the order of frequency of reactions. This incidence of sensitivity to sheep-wool is greater than is usually reported and may be accounted for by the relatively larger number of cases of occupational asthma due to wool occurring in the West Riding district. Of 40 cases of occupational asthma, 19 cases, or 47.5 per cent, were sensitive to wool. The duration of exposure to wool before the onset of symptoms of asthma averaged eight years, the extremes being a few months and eighteen years. Though the majority of patients sensitive to wool were sensitive to other allergens, wool appeared to be the most toxic allergen. Crude wool or wool treated chemically and physically may cause sensitivity. In view of the difficulty of isolating the patient from wool, specific desensitization was done in 14 cases. A stock-extract of sheep-wool was given by weekly intracutaneous injections until the full dose was reached, when the intervals were increased

to one month. In 3 cases injections were given every two hours during periods of from three to five days. Systemic reactions were not observed. The majority of desensitized patients had increased tolerance and were able to return to their work.—*Occupational Asthma with Reference to Wool Sensitivity, H. H. Moll, Lancet, June 24, 1933, ccxxiv, 1340.*—(*R. M. F.*)

Asthma in Childhood.—Asthma most often begins in childhood, and it is then, when physical and psychoneurotic influences are negligible, that it is in its purest form. Only in certain cases does asthma persist into adult life, when habit and psychological changes favor chronicity and when emphysema and chronic bronchitis may complicate the disease. Thus, prompt recognition of asthma and search for its cause facilitate cure. Repeated short attacks of bronchitis in infancy may not be recognized as asthma until later in childhood, when the disease resembles more the adult types of spasmodic and bronchitic asthma. Spasmodic asthma has a stronger hereditary element than bronchial asthma. The latter often follows pertussis or bronchopneumonia, which has left some focus of chronic inflammation in the lung. A family history of asthma is found in about 30 per cent of cases, and, if allied conditions, such as migraine, hay-fever, urticaria and bilious attacks are counted, the figure reaches 50 per cent. Allergy is a complicated but important factor in asthma. Hypersensitiveness may be acquired or inherited. The child inherits a readily sensitizing constitution rather than hypersensitiveness to any special substance. Asthmatic children and their parents are most often of the "intelligentsia" type. Stimuli exciting asthmatic attacks are of great variety. Urticaria, eczema, ichthyosis, hay-fever, paroxysmal sneezing, and *laryngitis stridulosa* are often associated with asthma. Other manifestations, such as migraine, cyclical vomiting, vertigo, and lapses of consciousness may accompany and, at puberty, replace asthmatic attacks. Fleeting pains in the extremities, head and abdomen, common to rheumatism and asthma, may be evidence of a general allergy. Cough with much sputum, inducing vomiting, is characteristic of childhood asthma. An enlarged thymus must be remembered as a cause of obstructed respiration. Foci of infection should be sought for. Patches of fibrosis, enlarged lymph nodes and bronchiectasis are the most frequent pulmonary lesions. Infants are more often sensitive to foodstuffs, whereas older children more often react to epidermal derivatives. Feather pillows should be replaced with kapok pillows. Hypochlorhydria is found frequently. Treatment consists of protection from allergens, desensitization, and nasopharyngeal operations as indicated, and the use of drugs such as hydrochloric acid, stramonium and lobelia, potassium iodide, adrenalin and ethyl-iodide inhalations.—*Asthma in Childhood, B. Schlesinger, Lancet, June 3, 1933, ccxxiv, 1194.*—(*R. M. F.*)

Hay-Fever Pollens.—The author attempts to evaluate on a nation-wide scale the pollens of secondary importance in the ragweed area during the ragweed season. Most of the statistics were obtained by making differential counts on all pollen slides exposed during 1932 at stations of the United States Weather Bureau, the Canadian Meteorological Service, and the Mexican Meteorological Service. In the eastern part of the United States the autumnal pollen problem is comparatively simple. In a number of Eastern cities, ragweed constitutes more than 98 per cent of the total fall pollen crop. In the Middle West there is a much larger percentage of pollen from other sources than ragweed,—in some cases more than 50 per cent. The country may be sharply divided at the 95th meridian (east edge of Kansas) into an eastern region and a western region. The hay-fever plants of sufficient distribution to be considered complicating factors in ragweed hay-fever are hemp, Palmer's amaranth, Russian thistle, Kochia and the various species of sage. They are largely confined to the area between the Mississippi River and the Rocky Mountains. Fall-pollinating grasses are of some importance in the Gulf region and of possible importance further north. During favorable seasons in central Texas, elm pollen is of clinical importance.—*Complicating Pollen Factors Encountered in Ragweed Hay-Fever: an Atmospheric Study, O. C. Durham, J. Am. M. Ass., June 10, 1933, c, 1846.*—(*G. L. L.*)

Treatment of Hay-Fever.—In a study of the effect of air-conditioned atmosphere on individuals with symptoms of hay-fever and pollen-asthma, a room large enough to accommodate 4 bed-patients was equipped with an air-conditioning unit. The room had 5 windows, and one door opening on the corridor. These windows and the door were kept closed but not sealed; consequently some outside air entered the room. The control of temperature and relative humidity in the outfit is accomplished with a cooling coil in an air-conditioning unit. The air is forced over this coil by fans, and is lowered to a predetermined temperature at which it will hold only a certain amount of moisture. The excess moisture condenses out of the air,

passing from the instrument into a drain-pipe. After the air passes over this cooling coil the air temperature is between 40° and 50°F., and at that temperature it is about 100 per cent saturated with moisture. This air, diffusing with the air in the room and warmed by the heat coming in from various sources, rises in temperature and in so doing is lowered in relative humidity The excess moisture which condenses out of the air as water and which runs into the drain-pipe carries with it practically all dust particles and grains of pollen which are blown over the cooling coil. Throughout the period of the experiment, the temperature was maintained 10° below the outside temperature in the open ward and the humidity was maintained at 40 per cent. Whereas slide-counts outside the room showed from 10 to 30 grains of ragweed pollen per square centimetre, the slide in the air-conditioned room showed no pollen. On different days, groups of 10 patients were sent to this room and observed, to determine the effect on their symptoms. Complete relief was given to patients suffering with symptoms of hay-fever, whether they occupied the room for several hours or for longer periods of time. Striking relief was given to patients suffering with pollen-asthma within twelve hours after admission to the room. Control cases did not respond in a satisfactory manner. Unfortunately, when patients were discharged from the room to the outside atmosphere their symptoms returned with equal severity. While for economic reasons, the method is as yet not satisfactory, to those individuals who can afford to install such a system, great relief can be offered.—*The Treatment of Hay-Fever and Pollen-Asthma by Air-Conditioned Atmosphere, L. N. Gay, J. Am. M. Ass., May 6, 1933, c, 1382.*—(G. L. L.)

Treatment of Hay-Fever and Asthma by Filtered Air.—Studies of pollen concentrations in wards in which the air was filtered by special filters, manufactured by several companies, indicate that experimental and commercial filters as now manufactured are not 100 per cent efficient for the removal of pollen. However, air filtration that removes all but traces of pollen will relieve symptoms of hay-fever. Symptoms reappear on exposure to pollen-laden air regardless of length of confinement to filtered air. The time for reappearance of symptoms is inversely proportional to the pollen concentration outdoors. Filtered air, cooled from 8° to 10°F. below outside temperatures without dehumidification, does not give as prompt or as great relief from symptoms of hay-fever as uncooled filtered air. If patients with pollen asthma are confined in filtered air for a sufficient length of time, their subjective symptoms of asthma will be relieved. The objective evidences of asthma disappear less readily. Patients with asthma require a longer period of initial confinement in filtered air than those with hay-fever. The tolerance period on exposure to pollen varies in the same individual from day to day because of the variation in pollen concentration outdoors. Cooling of filtered air may aggravate asthma because of an increase in relative humidity.—*The Effect of Air Filtration in Hay-Fever and Pollen-Asthma: Further Studies, T. Nelson, B. Z. Rappaport and W. H. Welker, J. Am. M. Ass., May 6, 1933, c, 1385.*—(G. L. L.)

Viosterol in Hay-Fever.—The effects of viosterol of high potency were studied by the authors in a group of 11 patients from 1930 to 1932, three of the patients having infectious asthma, 2 urticaria and 6 seasonal hay-fever. Sterile viosterol, in concentrations of 8,000 and 10,000, was used. These concentrations are respectively 80 and 100 times the concentration of the 250D commercial preparation. In these patients it was administered intravenously, in some daily, in others twice a week, in doses of 0.5 cc. Viosterol had no effect on the symptoms in the patients with urticaria nor the three with chronic asthma due to respiratory infection. All hay-fever patients were well protected during the season of 1932 as compared to their symptoms during previous seasons; one was relieved almost entirely. The blood-calcium and potassium in allergic individuals determined on different days during control periods show marked variations in the same individuals. Massive doses of viosterol raised the calcium to very high levels, lowered the potassium level, diminishing its wide fluctuations, and stabilized the potassium-calcium ratio at a relatively low level. The threshold of toxicity varies in different individuals and may even vary in the same subject at different times. Toxic symptoms are readily recognized and quickly abated on discontinuance or reduction of the amount administered.—*Viosterol of High Potency in Seasonal Hay-Fever and Related Conditions, B. Z. Rappaport and C. I. Reed, J. Am. M. Ass., July 8, 1933, ci, 105.*—(G. L. L.)

Influenza and Pulmonary Tuberculosis.—The activation of pulmonary tuberculosis following influenza may occur either by haematogenous propagation or by secondary infiltration around older foci. In haematogenous cases the apices and upper parts of the lungs are usually affected. Pulmonary infiltrations, due to influenza as such, may closely resemble tuberculous infiltrations. Eight

patients in whom pulmonary tuberculosis was activated following influenza are reported in some detail.—*Die Infiltrierung in den Beziehungen Zwischen Grippe und Lungentuberkulose, A. Held, Beitr. z. Klin. d. Tuberk., June 24, 1933, lxxxiii, 97.*—(*M. P.*)

Migrating Pneumonia.—Pneumonia and atelectasis migrate to definite areas of the lungs in accordance with the principles of "internal drainage" advanced by Faulkner. These involve the spilling of pus or secretion from place to place within the same or opposite lung, causing the plugging of bronchi, obstruction of air-flow, and the infection of previously uninvolved areas. The spilling is mechanical and depends upon the amount and viscosity of the intrabronchial pus, the posture of the patient, the direction of the bronchi, and the relative position of the bronchial openings. There is no migration in the absence of an excess of intrabronchial secretion. Thick secretion produces lobar pneumonia and thin secretion produces bronchopneumonia. Prevention of migration depends upon the removal of intrabronchial pus by postural drainage, the use of expectorants and bronchoscopy. The effects of various postures upon internal drainage are illustrated by roentgenograms.—*Migrating Pneumonia: Certain Mechanical Factors in Its Production, Prevention, and Treatment, W. B. Faulkner, A. N. Fregeau and E. C. Faulkner, Ann. Int. Med., April, 1933, vi, 1289.*—(*R. M. F.*)

Chronic Nontuberculous Pulmonary Diseases in Children.—Judging by the published returns of local authorities the differential diagnosis of pulmonary tuberculosis in young subjects gives rise to greater difficulty than in adults, with the result that many beds in sanatoria are filled by children not suffering from tuberculosis at all. When all clinical evidence, including that obtained from the X-ray, is properly utilized, an accurate differentiation can usually be made. The X-ray alone may be misleading, because certain types of chronic pulmonary disease are indistinguishable roentgenographically from tuberculosis. The commonest nontuberculous condition to be considered is bronchopneumonia, especially when suppuration has occurred. Here a careful history and repeated sputum examinations are helpful in differential diagnosis. Pleurisy, especially if there is a purulent exudate, may give rise to chronic pulmonary fibrosis. Bronchiectasis accounts for much of the chronic chest disease seen at dispensaries and is not seldom confused with tuberculosis. Since the wider use of lipiodol the diagnosis is made correctly more frequently. The chronic inflammatory condition, characterized by frequent colds associated with cough and repeated attacks of bronchopneumonia, is rather common and may result in the development of bronchiectasis. The onset may take place at any time from infancy upwards. The common exciting causes are measles, whooping-cough and pneumonia.—*Chronic Inflammatory Conditions Simulating Pulmonary Tuberculosis in Young Subjects, G. Jessel, Brit. J. Tuberc., May, 1933, xxvii, 69.*—(*E. H. K.*)

Spontaneous Nontuberculous Pyopneumothorax.—Spontaneous pneumothorax (nontuberculous) complicating pneumonia in children probably occurs with more frequency than one would infer from the meagre literature on the subject. Four cases are reported in children from 1 to 7 years of age, the complication occurring approximately on the 11th to the 17th day after the onset of the pneumonia. The condition is due to softening of the lung tissue, or rupture of a subpleural abscess or emphysematous bleb. The onset in children is usually insidious. The characteristic signs of tympany, positive coin-test, succusion splash, and amphoric breathing may be masked if a large amount of fluid is present, so that the roentgen-ray may be needed to reveal the presence of air in the pleural cavity. With small amounts of fluid no active treatment is necessary. With larger amounts the case should be handled in the same way as any other case of empyema. Contrary to the general consensus of opinion in the literature, the occurrence of nontuberculous pyopneumothorax probably does not have an adverse effect on the course or the outcome of an underlying pneumonia.—*Spontaneous Nontuberculous Pyopneumothorax as a Complication of Pneumonia in Children, Murray B. Gordon and Alexander S. Manne, J. Ped., May, 1933, ii, 603.*—(*M. D.*)

Concealed Pneumothorax.—Roentgenograms taken in other than the customary routine anteroposterior position frequently reveal surprising information that would otherwise be missed. First, of diagnostic importance, a pneumothorax may be almost completely obscured by overlying pulmonary tissue when films are taken in the routine position. Three cases are presented, the roentgenograms of which illustrated that, although the amount of air introduced in the induction of artificial collapses and manometric determinations left no doubt of the creation of a pneumothorax, correct visualization was possible only by oblique and

particularly profile exposures. With spontaneous pneumothorax the problem is more difficult, for, if the condition is unsuspected clinically, it may completely escape identification in an anteroposterior roentgenogram. Two cases are presented, in which, although the history and physical examination suggested spontaneous pneumothorax, they could not be visualized until profile roentgenographic plates were taken. In one of these the presence of pneumothorax was verified by the insertion of a needle and manometric measurements. Second, artificial pneumothorax may seem, in an anteroposterior exposure, to be quite inextensive and inefficacious when, in reality, the reverse may be true. Here a correct visualization has important therapeutic implications, as it may be erroneously decided to abandon the pneumothorax. Here, again, as illustrated in 3 cases, exposures from various angles will often reveal in sufficient detail the true extent of the pneumothorax, location of adhesions, and sufficiency of the collapse. In addition, the instillation of lipiodol into cavities will often aid in delineation of the required detail.—*Pneumothorax invisibles ou maxques, Pruvost and Henrion, Rev. d. l. Tuberc., May, 1933, i, 449.*—(*A. E. M.*)

Measurement of Volume of Pneumothorax.—A rather simple technique is described by which the volume of a pneumothorax can be measured with the help of hydrogen injected into the pneumothorax space. The concentration of hydrogen in a later specimen of air removed from the pneumothorax permits the calculation of the actual volume.—*Über die Messung des Pneumothoraxvolumens mittels Wasserstoff, A. Anthony, K. Schlapper and H. Isakowitz, Beitr. z. Klin. d. Tuberk., May 22, 1933, lxxxii, 739.*—(*M. P.*)

Pathology of Pleural Adhesions.—Pleural adhesions developing in artificial pneumothorax were studied by the thoracoscope and roentgenogram. Differentiation into two general groups was achieved. Adhesions derived from pleural exudations by organization were termed "neoformations," while those arising by transformation of pleural or pneumonic tissue were classified as "metaformations." The former evolve under the influence of a biological factor, the underlying visceral inflammatory lesion, and in the early stages of their development are fragile, variegated in form and direction, composed of a very vascular cellular yellow connective tissue containing few collagen fibres. Subsequently, under the mechanical influence of dynamic respiratory movements and (or) healing of the underlying lesion they are either ruptured or transformed into solitary, long, strong, white bands, relatively avascular histologically and containing many white collagen fibres. Both these types of neoformations may regress spontaneously. Metaformations evolve by evulsion of pulmonary parenchyma and pleura with transformation of these vestiges by condensation and fibrosis, the end-result often resembling that of neoformations. They may have two free borders or be falciform in shape. This classification of adhesions has the following therapeutic application: Early neoformations should not be systematically operated upon, because they are so vascular, and because they often resolve as and if the underlying inflammation responds to dietetic-hygienic, chemical, or other forms of therapy. Section is often necessary, however, if they are surrounded by late neoformations which in general require operative interference. The prefered operative technique is that of electrical cutting and coagulation. If this cannot be done, the dynamic respiratory movements should be reduced to a static pull if possible, either by increasing the intrapleural pressure as by raising the gas-pressure or the introduction of oils, or by reducing the intrapleural pressure by phrenicectomy. Metaformations must be sectioned by intrapleural or extrapleural dissection of the parietal insertions. This may be facilitated by injection of the base with methylene-blue which will outline it. If this is not practical, oleothorax or phrenicectomy may be resorted to.—*Contribution a l'étude de la formation, de l'évolution et du traitement des adhérences pleurales au cours du pneumothorax artificiel, G. Derscheid and P. Toussaint, Rev. d. l. Tuberc., January, 1933, i, 5.*—(*A. E. M.*)

Idiopathic Pleuritis.—A total of 60 cases of idiopathic exudative pleuritis was analyzed in regard to sex-distribution, age-distribution, seasonal variation, and in regard to severity and treatment. In more or less grave cases, the methodical withdrawal of the fluid is the treatment of choice. Both signs and symptoms of disease disappear much more quickly under this treatment than with conservative therapy.—*Über die Pleuritis exudativa "idiopathica," H. Zekert, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii 409.*—(*M. P.*)

Lymph Cyst of Hilum.—In a patient with pneumonoconiosis, a cystic alteration of hilar lymph nodes was found. This was most pronounced in the nodes at the bifurcation. Histologically, the cysts consisted of dilated lymph-sinuses and lymph-vessels.—

Lymphadenocele der Lymphdrüsen an der Lungenwurzel, F. Steffen, Beitr. z. Klin. d. Tuberk., March, 1933, lxxxii, 501.—(M. P.)

Pathology of Bronchiectasis.—Thirteen patients, ranging in age from six weeks to six years, provided the material for this pathological study of bronchiectasis. In 11 of these the lungs were obtained at autopsy; in the other two, studies were made of lobes removed surgically. In the latter two cases respiratory symptoms had been of almost three years' and five and a half years' duration; in the former 11 cases the duration of symptoms had varied from ten days to six and one-half months. *Conclusions:* Bronchiectasis has its origin in some type of acute respiratory disease. The essential lesion is an acute ulcerative bronchitis with destruction of epithelium, muscle and elastic fibres of the bronchial wall, frequently with extension of the destructive process into the surrounding parenchyma of the lung. This destructive process is favored by mechanical obstruction, which may be brought about by a foreign body, caseous mediastinal nodes, a neoplasm, swollen bronchial mucosa or inspissated exudate. As destruction proceeds, the bronchial lumen becomes surrounded by a wall of highly vascularized granulation-tissue, in which muscle and elastic elements are usually absent. This granulation tissue then becomes relined by epithelium, which is frequently of a modified type, and, as the former becomes fibrosed, a simultaneous fibrosis takes place in the adjacent parenchyma of the lung. The appearance of the bronchi in the early stages of bronchiectasis before relining with epithelium takes place is such as to suggest that healing at this stage with actual diminution in size of the bronchi may be promoted by bronchoscopic drainage. After relining with epithelium, such healing is no longer possible. While fibrosis of the lung commonly accompanies bronchiectasis, nevertheless bronchial dilatation can and does occur long before the newly-formed fibrous tissue has begun to contract; the dilatation, therefore, cannot be the result of contraction of the fibrous tissue. When a whole lobe is involved in the advanced chronic stage of bronchiectasis, it has absolutely no value from the standpoint of function. It may, moreover, be the source of infection of the accessory nasal sinuses, to the inflammation of which it may contribute. Drainage from such a lobe is retarded by partial or complete loss of muscle and elastic tissue in the bronchial walls and of cilia on the lining epithelium, and by the presence of transverse folds of mucosa. The healing of such a lobe by conversion into a solid fibrous mass is rendered impossible by the presence of innumerable epithelium-lined cavities and dilated bronchi. The bacteriology of bronchiectasis is the bacteriology, not of the chronic bronchiectatic lung, but of the bronchopneumonia or other acute respiratory disease which marked the onset of symptoms. While both pyogenic cocci and fusospirochaetal organisms may be found in early cases, the most destructive lesions are produced by the latter group.—*Pathology of Bronchiectasis, I. H. Erb, Arch. Path., March, 1933, xv, 357.—(E. H. K.)*

Atelectatic Bronchiectatic Lobe.—Three cases are reported which show a triangular honeycombed shadow of increased density lying in the right cardiohepatic angle and due to an atelectatic bronchiectatic lobe. —*The Significance of a Shadow in the Right Cardiohepatic Angle, L. R. Lingeman, Radiology, May, 1933, xx, 391.—(T. O. R.)*

Bronchial Diverticulosis.—A man, 50 years old, complained of cough and copious purulent expectoration. Two years previously bronchiectasis had been diagnosed elsewhere after lipiodol injection. On admission, the physical signs were those of bronchitis and emphysema. The roentgenogram showed only increased striation. Bronchoscopy was done. The trachea was considerably dilated. Between the tracheal rings the mucous membrane was deeply depressed and in many of these depressions small openings were seen. This condition was present throughout the trachea and the right and left main bronchi as far as could be seen. Further, there appeared to be an abnormal number of very small bronchial openings branching directly from the main bronchi. Lipiodol was introduced through the bronchoscope. A roentgenogram failed to show bronchiectasis of the ordinary type, but the lipiodol outlined the dilatation of the trachea and the entire bronchial tree, a tracheal cyst the size of a shilling at the level of the top of the manubrium, the depressions between the tracheal rings, and the numerous diverticuli which accompanied the bronchial tree to its smaller branches. These findings have a superficial resemblance to those of congenital bronchiectasis.—*Bronchial Diverticulosis, H. V. Morlock and A. J. S. Pinchin, Lancet, July 29, 1933, ccxxv, 236.—(R. M. F.)*

Bronchial Fistula.—Chronic empyema is often associated with bronchial fistula, but it may be difficult to determine if such a fistula exists. A simple apparatus, consisting of a vacuum-flask, water-manometers and a funnel, which is applied tightly to the chest-wall around the empyema opening,

enables one to make this diagnosis with accuracy. The vacuum will be found to persist in the test flask if no bronchial fistula is present, but the vacuum is quickly lost if a bronchial fistula exists. The accuracy of the apparatus can be verified by having the patient breathe oxygen and then analyzing the oxygen content in the flask; if over 21 per cent, a bronchial fistula must be present. The apparatus can also be used to measure the size of an empyema cavity.—*Diagnosis of Bronchial Fistulas, R. B. Bettman, S. Perlow and D. J. Cohn, J. Thorac. Surg., December, 1932, ii, 213.*—(*B. B.*)

Emphysema.—Two types of emphysema are recognized, the obstructive, and the senile or nonobstructive. Obstructive emphysema is characterized by large lungs and by impairment of respiratory function. An associated history of bronchial obstruction is usual. In nonobstructive emphysema there is very little, if any, increase in size of the lung, and but little loss of respiratory function. The respiratory function of patients with nonobstructive or senile emphysema was compared with that of normal controls and with that of patients with bronchial obstruction. In nonobstructive emphysema, it was noted that abdominal breathing was far more prominent than in the obstructive variety. Moreover, in nonobstructive emphysema the diaphragmatic movements were greater than normal. Tracings of obstructive emphysema showed a definite preponderance of activity of the chest-wall compared to that of the abdomen. Even with attempted deep inspiration, there was little abdominal excursion. Conversely, the tracings of patients with nonobstructive emphysema demonstrated increased excursion of the abdominal muscles in contrast to diminished chest movement. Further functional studies on each type of emphysema were compared. The vital capacity is reduced in both types of advanced emphysema. It is relatively more reduced in the obstructive than in the senile form. The arterial blood-pressure is usually low in obstructive emphysema but it is apt to be elevated in the senile type, which usually occurs in older people, and an associated arteriosclerosis is common. The venous pressures were found to be increased in obstructive emphysema but were normal in the nonobstructive form. In obstructive emphysema the oxygen content of the arterial blood is low, even with the patient at rest, and the carbon-dioxide content may be increased, while in normal senile emphysema they were found to be well within normal limits. It is therefore apparent that nonobstructive emphysema leads to very little impairment in respiratory function, which throws much doubt on the supposition that the condition is primarily a disease of the lung. It was noted that one constant lesion is straightness and stiffness of the thoracic spine, especially in the early stages of the disease. In contrast to this straightening, the roentgenograms of the spine of obstructive emphysema show a continuous curve. The authors conclude that nonobstructive emphysema is not primarily a pulmonary disease but merely a change in the position of the lungs secondary to an increase in the size of the thoracic cage. In the advanced cases, alveolar distention with loss of elasticity occurs. The thoracic deformity is due to a straightening of the dorsal spine with kyphosis in the later stages. The underlying lesion is a degenerative process in the intervertebral disks.—*Nonobstructive Emphysema, W. B. Kountz and H. L. Alexander, J. Am. M. Ass., February 25, 1933, c, 551.*—(*G. L. L.*)

Heart in Obstructive Emphysema.—In a case of suspected foreign-body in the trachea, there was a marked difference in the size of the cardiac silhouette in the inspiratory and expiratory films of the chest. In the fluoroscopic examination preceding bronchoscopy it was noted that both leaves of the diaphragm occupied low positions and had little respiratory excursion. At the moment of full expiration the heart seemed "squeezed" between the two overinflated lungs and showed a marked diminution in its size. This decrease is far in excess of that existing between the extremes of cardiac systole and diastole. Bronchoscopy revealed a foreign-body (peanut) obstructing the trachea a few centimetres above the carina. Widening of the air-passage with each inspiration and narrowing during expiration, producing an expiratory valvular obstruction, was observed bronchoscopically. The foreign-body was removed. Films, taken in full inspiration and expiration after removal of the foreign-body, revealed normal cardiac size and relationships in both respiratory phases. Three other similar cases have been noted by the authors. The chest roentgenograms in the four cases showed identical conditions of (1) decrease in size of cardiac silhouette, (2) overinflation of the lungs, and (3) depressed diaphragms in the expiratory phase of respiration. The percentage of decrease in the size of the heart as measured by surface area in these cases varied from 8 to 25. The decrease in transverse diameter varied from 8.8 to 28 per cent. In order to confirm the changes in heart shadow observed in these cases and to determine whether or not the compression of the heart and great vessels by the overinflated lungs contributes

to the signs of bilateral obstructive emphysema, experimental studies were undertaken of artificially produced bilateral obstructive emphysema. A long hollow brass tube with threaded ends was employed, to one of which could be fitted metal olives of varying size to serve as obturators of the trachea. The other end of the tube was fitted with a Y connection piece. An ordinary flutter valve was attached to one limb of the Y, the second arm being connected to the mercury manometer in order to obtain intratracheal pressure readings. The experimental films of 4 dogs showed well-developed bilateral obstructive emphysema as a result of expiratory valvular obstruction and definite "cardiac squeeze" with each expiratory effort on fluoroscopic examination. Measurements of the transverse cardiac diameter showed a decrease of from 6.8 to 14 per cent with expiratory valvular obstruction. Planimetric measurements showed a decrease of from 7 to 10 per cent in surface area as compared with surface area on inspiration.—*Heart in Bilateral Obstructive Emphysema Due to Tracheal Foreign Bodies, S. Moore, H. M. Wilson and M. F. Arbuckle, J. Am. M. Ass., March 11, 1933, c, 711.*—(*G. L. L.*)

Hernia of Lung.—Hernia of the lung may be cervical, thoracic, or diaphragmatic. It may be congenital, traumatic, consecutive, spontaneous, or pathological. Hernia is dependent upon a *locus minoris resistentiae* associated with an increased pressure within the lungs themselves. As a rule cough is hard, spasmodic and unproductive. Localized pain may be the first sign. In cases of concurrent bronchitis, repeated haemoptyses have been observed. A soft, crepitant, bulging mass in the chest-wall, increasing in size during expiration, exertion and cough, and diminishing during inspiration, is pathognomonic of hernia of the lung. Fluoroscopic examination in the anteroposterior position may show only normal or increased transparency at the site of the hernial bulge. In the lateral or oblique positions, on the tumor side, a bulging pocket of air which changes with the respiratory phase can be noticed readily in the thoracic wall. Hernia of the lung must be differentiated from subcutaneous emphysema, *emphysema necessitatis*, abscess of the lung, pulmonary suppuration perforating into the chest-wall, tumors of the thoracic wall, pulmonary tuberculosis, caries of the rib, and gas-bacillus infection. A mechanic, 42 years of age, was admitted to the hospital following a severe crushing injury to the right chest. He was in extreme pain and showed evidences of air-hunger. Physical and X-ray examinations revealed (1) a small lacerated wound in the right anterior chest-wall with destruction of some of the intercostal tissues at the second and third ribs; (2) multiple fractures of the right anterior ribs; (3) injury to the right lung inducing bronchial fistula, open pneumothorax and haemothorax; (4) subcutaneous emphysema extending from the lower jaws to the iliac crests; and (5) a pulmonary hernia. During the first week the hernia increased in size. A pad was strapped over the lesion with visible improvement in the patient's comfort. X-ray examination twelve days after admission showed (1) a diminution of the interstitial emphysema, (2) a large hydropneumothorax, (3) a localized pocket of air and fluid on the right anterior chest-wall in the region of the second and third ribs, and (4) a pocket of air and fluid behind the midportion of the gladiolus. Ten days later 915 cc. of pus was aspirated and replaced with air. X-ray check-up, done eleven days later, showed increased right pyopneumothorax and interstitial emphysema along the anterior chest-wall. Aspiration was attempted but was unsuccessful. While on the table the patient expectorated a considerable quantity of purulent material. The general clinical condition improved, and the patient left the hospital forty-one days after admission. X-ray check-up, thirteen days after discharge, revealed obliteration of several pockets of air and fluid, complete absorption of interstitial emphysema, reëxpansion of the right lung, residual thickening of the right basal pleura. Shortly afterward he resumed his work.—*Hernia of the Lung: Roentgen Observations, with Report of a Traumatic Case, H. A. Olin, Radiology, April, 1933, xx, 253.*—(*T. O. R.*)

Bilateral Diaphragmatic Hernia.—A review of the literature reveals no case of bilateral diaphragmatic hernia. Herniae through the left and right foramina Morgagni occurred in a woman of 60 years. Because no history of an accident was elicited, the hernia was concluded to be due to a congenital defect. The Mueller and Valsalva tests aided materially in the diagnosis. The patient refused operative treatment. The medical treatment includes the prevention of constipation, avoidance of strenuous exercise, and small and frequent feedings.—*Bilateral Diaphragmatic Hernia, E. A. May, Radiology, April, 1933, xx, 275.*—(*T. O. R.*)

Diaphragmatic Hernia.—A case is reported in which the small intestine, caecum, ascending and transverse colon had herniated through the right side of the diaphragm. —*A Case of Diaphragmatic Hernia, J. R. Crumbie and J. Stephens, Brit. M. J., July 1, 1933, no. 3782, 13.*—(*T. O. R.*)

Diaphragmatic Hernia.—The death of a man of 25 years was due to a generalized peritonitis which resulted from the perforation of a stercoral ulcer of the caecum. The hepatic flexure herniated through the right side of the diaphragm causing a chronic intestinal obstruction which resulted in the ulcer formation.—*A Case of Diaphragmatic Hernia, A. H. Morley, Brit. M. J., July 1, 1933, no. 3782, 13.*—(*T. O. R.*)

Paraoesophageal Diaphragmatic Hernia.—A man of 51 years sought advice for attacks of dysphagia. These attacks had increased in frequency during the preceding two years. Radiography, after the ingestion of a barium meal, revealed a paraoesophageal diaphragmatic hernia. The first approach was by way of an epigastric, paramedian laparotomy but, inasmuch as efficient repair of the aperture from this aspect seemed unlikely, a thoracotomy was performed. The eighth rib was resected for practically its entire length through a long incision extending back to the spinous processes. The hernial sac was satisfactorily exposed and the greater part of it removed. Closure of the muscular defect without any tension was accomplished by the use of tendinomuscular strips cut from the semispinales muscles at the vertebral end of the incision. Six such sutures were "darned" over the aperture. While this method necessitates a more severe operation than the abdominal approach, it allows a closer approximation to the ideal radical cure than the mere suture of the edges of the aperture.—*Para-Oesophageal Diaphragmatic Hernia, N. C. Lake, Brit. M. J., August 19, 1933, no. 3789, 331.*—(*T. O. R.*)

Clinical Aspects of Pulmonary Suppuration.—The diagnosis of pulmonary suppuration is indefinite because it includes a group of diseases with a variety of causative factors. The majority of pulmonary abscesses occur after oral operations. However, they may follow acute respiratory-tract infection, injury, drowning accidents, or undetermined causes. They may occur at any age, but in the earlier years of life they are commonly due to aspiration of a foreign-body and in the later years are associated with new growths. The infection is usually polymicrobic. The history suggests the diagnosis. Roentgen and bronchoscopic examinations are invaluable for a complete study. The physical signs are not distinctive. Roentgenological and bronchoscopic examinations along with microscopical sputum examinations usually eliminate simulating conditions. Treatment is conservative and surgical. Rest, hygienic-dietetic measures, and postural or bronchoscopic drainage may prove adequate and serve to improve the general condition of the patient. Medical treatment alone is indicated in the early acute phase of pyogenic infections before abscess-formation has occurred. Arsphenamine may be useful in fusospirochaetal infections. Bronchiectasis is prone to occur whenever the integrity of the bronchial wall is impaired and when, in addition, there is an increase in the intrabronchial pressure. It also results from extrabronchial traction in pulmonary fibrosis. It may follow mild attacks of whooping-cough and measles. It may develop insidiously during the course of a simple chronic bronchitis secondary to a latent focal infection in the upper respiratory tract, and especially of the nasal sinuses. An acute bronchiectasis occurs at times in influenza. The classical symptoms and signs are well known. Involvement of the upper lobe is without paroxysmal cough and foetid expectoration. In a dry haemoptysic type there is a chronic cough, with little or no expectoration, with recurrent attacks of blood-spitting, and the physical signs of chronic bronchitis with moderate pulmonary fibrosis. Collapse therapy is to be considered only in nonobstructive types of bronchiectasis. In advanced bilateral cases, palliative treatment, utilizing bronchoscopic and postural drainage combined with hygienic-dietetic care, must be relied upon. Neoarsphenamine and autogenous vaccines may be of value. The clearing of focal infections, particularly of paranasal sinusitis, is helpful. Primary bronchial carcinoma occurs predominantly in men after the age of 35. The early symptoms are those of bronchial irritation and the early signs those of bronchial obstruction. The onset is not infrequently like an acute respiratory-tract infection.—*Pulmonary Abscess, Bronchiectasis, and Pulmonary Neoplasms: Clinical Aspects, E. H. Funk, Radiology, May, 1933, xx, 353.*—(*T. O. R.*)

Roentgenological Aspects of Pulmonary Suppuration.—The roentgen appearance of pulmonary abscess is determined by the stage of the disease, the site of involvement, the presence of complications, and the technique of examination. At onset it presents an almost homogeneous density. Near the hilum it may resemble a collection of enlarged lymph nodes; in the centre of a lobe it is of irregular, rounded shape without distinct margin, dense at the centre and fading off into normal tissue; near the interlobar fissure the outline is triangular. This stage of pneumonitis may be followed by cavity-formation. In an acute abscess the wall is not well defined. Aetiological factors

and complications alter the characteristic appearance. With healing there is a gradual diminution in both density and extent of the lesion. Bronchiectasis due to long continued bronchial occlusion is usually unilateral and frequently involves the whole lobe. Absorption of the air distal to the occlusion leads to atelectasis. Bronchiectasis due to disease of the bronchial wall is often bilateral, usually basal, and is less extensive. Cavity-formation may follow either type. The exact architectural changes can only be accurately delineated by instillation of iodized oil. Therapeutic procedures instituted for either abscess or bronchiectasis may alter the roentgenological appearance. The roentgenological diagnosis of pulmonary neoplasm depends upon the type of new growth, its location, and the changes which develop secondarily. Pressure causing partial occlusion of a large bronchus produces the signs of obstructuve emphysema but causing complete occlusion leads to atelectasis. Suppurative processes in this collapsed lung lead to abscess formation.—*Pulmonary Abscess, Bronchiectasis, and Pulmonary Neoplasm: Roentgenologic Aspect, J. T. Farrell, Jr., Radiology, May, 1933, xx, 360.—(T. O. R.)*

Bronchoscopic Aspects of Pulmonary Suppuration.—By bronchoscopy it is possible to see into the larger bronchi, to inspect the orifices of the smaller subdivisions, and to remove secretions from them. Therefore, the presence of obstruction to a bronchus, frequently the extent, and the nature of the obstruction may be determined. Foreign bodies, benign and certain malignant neoplasms, and occasionally broncholiths have been removed. Strictures may be dilated. Bronchoscopy is of inestimable value in the diagnosis, localization, and treatment of pulmonary abscess. Pneumonography can be done successfully only by bronchoscopic aid under fluoroscopic guidance. It is unusual for iodized oil, aided only by gravitation to enter spontaneously an abscess-cavity, which is incapable of emptying itself of pus. In early bronchiectasis the smaller bronchi are commonly involved first. However, in these cases one may suspect the diagnosis from the condition of the bronchial mucosa, the condition of the bronchial spurs, and the presence of pus in the smaller bronchi. Roentgenograms following the instillation of iodized oil clinch the diagnosis. Bronchoscopy is particularly useful in the treatment of bronchiectasis in children. Because pulmonary neoplasms frequently occur in the larger bronchi, an early positive diagnosis may often be made. Tissue may be removed for histological examination. Rigidity and fixity of the bronchial wall may be detected. Neoplasms of the bronchus have been removed successfully. Radon seeds may be implanted directly into the growth.—*Pulmonary Abscess, Bronchiectasis, and Pulmonary Neoplasms: Bronchoscopic Aspects, L. H. Clerf, Radiology, May, 1933, xx, 365.—(T. O. R.)*

Surgical Aspects of Pulmonary Suppuration.—Surgical intervention is indicated in the treatment of pulmonary abscess when conservative measures have failed to effect a cure within a reasonable period of time. When the abscess is close to the chest-wall, with pleural involvement, or when it is very large and the patient extremely ill, immediate operation is justified. Local anaesthesia, alone or in combination with nitrous-oxide analgesia, is preferable. An ample exposure of the involved area of lung is necessary. Obliteration of the abscess-cavity depends on contraction of its wall and on expansion of the lung. In abscesses of long duration, the removal of a sufficient amount of rib and the destruction of the wall are essential points. The patients who require operation are those who have failed to respond to other forms of treatment and even with operation the mortality in this group is high. Of the deaths, one-half were due to intracranial complications. These result from emboli originating in the lungs. There are two classes of procedures for the treatment of bronchiectasis, namely, those which aim to bring about collapse of the involved pulmonary tissue and those which have for their object the removal of the diseased part of the lung. Artificial pneumothorax should be tried in early cases, especially in children, but offers only a small chance for cure. Phrenic neurectomy sometimes gives good results in early unilateral cases. In extensive unilateral multilobar cases, a multiple-stage paravertebral extrapleural thoracoplasty may be the procedure of choice. Lobectomy is the ideal treatment, but the high mortality, due to the prolonged sepsis prior to operation, has made surgeons hesitate to use it. In those cases with extensively diseased and adherent lobe, cautery pneumonectomy is indicated. The ribs are resected over the involved lobe and the diseased portion destroyed in stages by the cautery. Those malignant neoplasms which arise from bronchial subdivisions and are apparently within a lobe of the lung are suitable for surgical intervention if diagnosed early. Because of the absence of infection, lobectomy should cause a decidedly lower mortality than when it is performed for bronchiectasis. Successful removal must be accomplished before metastases have

occurred.—*Pulmonary Abscess, Bronchiectasis, and Pulmonary Neoplasms: Surgical Aspects, J. B. Flick, Radiology, May, 1933, xx, 367.*—(*T. O. R.*)

Treatment of Empyema.—A patient with streptococcus empyema, treated by aspiration of pus and injection of antistreptococcus serum into the empyema cavity, recovered without operation. A patient with pneumococcus empyema, treated similarly with pneumococcus serum, did not improve until the empyema was drained surgically.—*A Treatment of Empyema, W. Broadbent, Lancet, June 24, 1933, ccxxiv, 1343.*—(*R. M. F.*)

Crypto-Empyema.—By crypto-empyema is meant an empyema that cannot be diagnosed by repeated needling. An exploratory operation and a determined effort to find pus is warranted in a patient who has suffered from pneumonia, and especially influenzal pneumonia, in whom the temperature is elevated for more than three weeks, in whom dyspnoea and sweating are present, and in whom dulness is found at the base of the lung, with diminished breath-sounds and vocal fremitus. There are two exceptions to this generality. If tubercle bacilli have been demonstrated in the sputum a diagnosis of crypto-empyema would be precarious. If the patient is very toxic and bringing up quantities of putrid expectoration, an open abscess or gangrene of the lung is probable and an operation would be too dangerous.—*Crypto-Empyema, A. R. Short, Brit. M. J., May 20, 1933, no. 3776, 870.*—(*T. O. R.*)

Empyema Drainage Tube.—In treating postpneumonic empyema the first measure usually consists of repeated aspirations by needle-puncture. Later, continuous drainage through a mushroom-tipped catheter is employed until the mediastinum becomes fixed. Subsequently rib-resection is done and a specially devised larger drainage-tube is inserted, and maintained in position until pulmonary reëxpansion is complete. This rubber tube is self-retaining and, because of its telescoping arrangement, is adjustable to any thickness of chest-wall. In reality, it consists of two tubes, each with its own flange,—a long, thinner, inner tube whose flange is placed against the parietal pleura, and a short, outer tube of greater bore which is snugly fitted over the inner tube and whose flange is adjusted to the skin of the outer chest-wall. After being placed in proper position these two tubes are sutured to each other. The irrigating nozzle can be placed in the tube, and a free two-way flow obtained because of the large bore (1.7 cm.). Twenty-three cases, including both nonspecific and tuberculosis cases, were satisfactorily treated in this manner.—*Flanged Telescoping Drainage Tube for Empyema Thoracis, C. M. Van Allen, J. Thorac. Surg., February, 1933, ii, 307.*—(*B. B.*)

Pleural Effusion and Empyema.—The differences between transudates and exudates are discussed, and it is pointed out that complicating inflammation usually converts transudates into exudates. A preponderance of small lymphocytes in the effusion indicates that it is of tuberculous or syphilitic origin, but the latter is so rare as to be negligible. An excess of eosinophilic cells is regarded as evidence against tuberculosis, and, if present in a clear effusion after pneumonia, suggests that pus will not form and that the prognosis is good. Pleural effusions occur in cases of tuberculosis, pneumonia, influenza, intrathoracic tumor, cardiac failure, renal disease, cirrhosis of the liver, leukaemia, Hodgkin's disease, rheumatism, acute general infections, pulmonary infarct, chronic intrathoracic infections, such as syphilis and actinomycosis, injury to the thoracic duct and filariasis, dermoid and hydatid cysts, encysted empyema, and subdiaphragmatic abscess or other infections, such as gastric ulcer, liver abscess and appendicitis. Effusions following injury or exposure to cold usually are tuberculous, due to infection already present. Effusions rarely accompany rheumatic fever, unless pneumonia, cardiac failure or tuberculosis is present. Typhoid bacilli probably will be found in tuberculous effusions occurring in typhoid patients. Colon bacilli may be found in tuberculous effusions or empyema following pneumonia, and in the latter case good results follow drainage-operations even though there is an offensive odor to the pus. A clear effusion may complicate encysted empyema. When pleural effusion develops after an abdominal operation, the possibility of a subdiaphragmatic abscess must be considered. A blood-stained effusion is most common in the case of neoplasm. Pleural endothelioma produces a large effusion that accumulates rapidly after aspiration. Carcinoma of the lung may lead to empyema. Mediastinal tumors usually produce a transudate by pressure on veins, and dermoid cyst must be suspected, because often it can be removed by operation. True chylous effusion, resulting from thoracic-duct obstruction, is rare. It smells of digested food, putrifies, and contains fat-globules which clear on shaking with a fat-solvent. Pseudochylous effusions may occur in neoplasms and chronic tuberculosis. The effusions of influenza and streptococcus empyema should

be drained by aspiration until pus forms, and then by operation. Application of this rule reduced the mortality from streptococcus empyema from 61.2 to 9.5 per cent in 1918. Pneumococcus empyema should be drained by operation, followed by constant irrigation with Dakin's solution to prevent chronic empyema. Aspiration of even small cardiac-failure effusions will aid the heart's action. Tuberculous effusions should be aspirated only if there is extreme dyspnoea, fever persists, the general condition is bad after six weeks, there is active disease in the underlying lung for which therapeutic pneumothorax is desired, or if active disease in the opposite lung is progressing. A tuberculous effusion indicates the presence of pulmonary disease, and in some 40 per cent of cases active pulmonary tuberculosis develops. This occurs within three, and rarely after five years. Tuberculous empyema is serious even though the health is apparently good. Aspiration and irrigation of the pleural cavity with Dakin's solution are done to promote re-expansion of the lung. If this does not occur, a thoracoplasty should be done. Tuberculous effusion complicating therapeutic pneumothorax should not be disturbed unless there is respiratory embarrassment or too great mediastinal displacement.—*The Causes and Treatment of Pleural Effusion and Empyema, L. S. T. Burrell, Brit. J. Tuberc., July, 1933, xxvii, 122.*—(*R. M. F.*)

Anaërobic Bacilli from Lung Abscess.—In a previous communication, various anaërobic organisms found in abscess of the lung were described. The present report embodies studies on the anaërobic flora of abscess of the lung, with special reference to the toxicity of the gram-negative anaërobic bacilli isolated from the lesions. For the study of the toxic factors produced by these bacilli, the Shwartzman phenomenon was employed. When the organisms were grown in suitable culture media and their filtrates injected intravenously into rabbits which had been prepared twenty-four hours previously by cutaneous injections of potent heterologous toxins (meningococcus toxin), approximately 80 per cent of the rabbits showed areas of haemorrhagic necrosis. With some organisms from abscess of the lung, attempts were made to reproduce the Shwartzman phenomenon by the use of homologous filtrates for cutaneous preparation. Of these organisms, only filtrates of *B. melaninogenicum* (in symbiosis with *Streptococcus gamma*) and Leptothrix proved potent. Further work on the pathogenicity of the various organisms, to be reported, points to the interesting fact that only those organisms which give the positive Shwartzman phenomenon, when they are grown in suitable culture media, are also able to produce severe necrotizing lesions in the lungs of rabbits.—*Anaërobic Gram-Negative Bacilli Isolated from Abscess of the Lung: Toxin Production as Demonstrated by the Shwartzman Phenomenon, J. Cohen, J. Infect. Dis., March–April, 1933, lii, 185.*—(*F. G. P.*)

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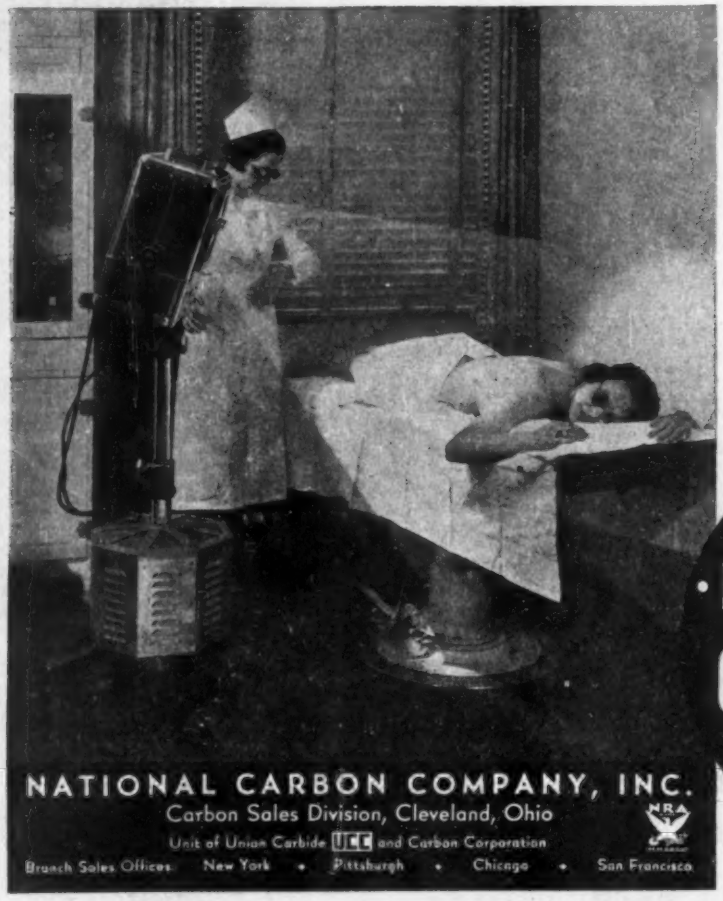

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